



**CLARIFICATIONS FOR UPGRADE OF THE ELECTRICITY COMPANY OF GHANA LIMITED (ECG) DATA CENTER & COMMUNICATION NETWORK**

**IFB: 5120400-02/IFB/CB/11/18**

SI	Ref	Question	Answer
1	Section IV- Bidding Forms	We are unable to find any price schedule forms DCCN (PA181018) Final with the soft copy of bidding documents provided by you. Kindly provide a soft copy of the price schedule.	Kindly read through the bidding document in particular Section IV – Bidding Forms and related topic on Price Schedules and the associated google link.
2	Section III: Bid Review, Evaluation Criteria and Bidder Qualification requirements	<p>item no. 4.0 Qualification, sub item no. 4.4.3</p> <p>Specific Experience in Key Activities</p> <p>In case of joint venture is any one bidder required to meet all the four requirements or one bidder can meet some requirements out of four and the remaining can be met by other bidder?</p>	In case of a joint venture, all requirements must be fulfilled by the Bidder for all four (4) Qualification requirements for 4.4.3- Specific Experience in Key Activities.
3	Section I: Instructions to Bidders	<p>item 5.4</p> <p>Government owned Enterprises says:- “ ... According to MCC PPG, Government –owned enterprises (“GOEs”) are not eligible to compete for MCC-funded contracts for goods or works....”</p> <p>Can the bidders owned by Governments other than Ghana participate in this bidding exercise?</p>	MCC Government-Owned Entity Policy applies to Bidders from all eligible countries, and not just Ghana.

SI	Ref	Question	Answer
4	Section VI: Particular Conditions of Contract	<p>item GCC 1.1(y)</p> <p>“ ... Government means Government of Ghana...”</p> <p>Can the bidders owned by Governments other than Ghana participate in this bidding exercise?</p>	Kindly see response to question 3 immediately above.
5	Section I: Instruction to Bidders	<p>item no. 17.6</p> <p>“ ... The bid security of a joint venture or other association shall be in the name of the association that submits the Bid. ....”</p> <p>It is proposed that bid security may also be allowed from the lead bidder only in case of joint venture or other associations?</p>	The requirements of ITB sub-clause 17.6 on Bid Security must be strictly complied with. It is not a subject for negotiation.
6	Section V: General Conditions of Contract	<p>Item 3.9 Joint Venture Entity</p> <p>“ ... If the supplier is a joint venture entity created by two or more firms, all such firms.....”</p> <p>How many entities can partner in a joint venture?</p>	There is no specified limit. A joint venture can be of two or more firms. One of the entities must be the lead and take responsibility for the bid.
7	Section V: General Conditions of Contract	<p>Item 14 Taxes and Duties</p> <p>“ ... As provided for under the terms of the compact, most services performed under and activities undertaken in furtherance of the contract, including in connection with the supply and installation of information systems, are exempt from taxes, duties, levies, contributions or other charges ..... during the effective term of the compact. ....”</p> <p>Are the bidders exempt from paying any taxes, duties, levies, contributions, income taxes, custom duties, sales tax, value added tax etc on the hardware and services during the currency of the</p>	The Purchaser can confirm that Bidders and their subcontractors are exempted from paying taxes including VAT and NHIL and Custom Duties regarding their activities involved in this Project.

SI	Ref	Question	Answer
		contract?	
8	Section V: General Conditions of Contract	<p>item 16 License to Software and Materials</p> <p>“ ... Except to the extent .....modify and maintain, including the right to allow the purchaser’s and it’s.....”</p> <p>Are the bidders required to provide source copy of the software to the purchaser to facilitate modifications in the source code?</p>	No.
9	Section VI: Particular conditions of contract,	<p>item no. GCC 1.1(xx)</p> <p>“ ... Other ECG remote sites.....”</p> <p>What is the quantity and details of such sites?</p>	120 Remote Sites. For details, kindly refer to Section VII, C2.1.13 where there is a reference to “120 VM’s being hosted” and 2.1.13 -2.2.3.7 of the Purchaser’s Requirements.
10	Section VI: Particular conditions of contract,	<p>“ ... Appendix 2, Adjudicator.....”</p> <p>We understand this is not required to be submitted along with the bid. However this may be required at the signing of the contract. Kindly confirm?</p>	The understanding is correct. This will be finalized by the time of signing of contract.
11	Section VII: Purchaser’s Requirements	<p>“ ... MiDA plan to engage suppliers to implement the DCCN upgrade and extension works and to provide a new building to house the Data Recovery Centre.....”</p> <p>Are the bidders required to build a new building to house the Data Recovery Facilities?</p>	<p>No. ECG already has a room in Kumasi for the Data Recovery.</p> <p>Please refer to B 1.1.1.3 of Section VII - Purchaser’s Requirements of the Bidding Document.</p>

SI	Ref	Question	Answer
12	Section VII: Business Objectives of the Purchaser	<p>“ ... To address the above problem, it is required that an enhanced Data Centre Services be installed in ECG house a centralized customer information system(CIS), a geographical information system(GIS) and an enterprise resource planning (ERP) system.....”</p> <p>Are the bidders required to supply, install and maintain the above systems as part of this bid?</p>	<p>No.</p> <p>However, the Data Center must be able to accommodate these applications from Hardware resource perspective. CIS GIS ERP MMS Others: OMS etc.</p> <p>Please refer to A 0.1.1 of Section VI - Purchaser's Requirements of the Bidding Document.</p>
13	Sec. I, Instructions to Bidders	<p>6.1 (d)</p> <p>(d) that, in the case of a Bidder not doing business within the Purchaser's country, the Bidder is or will be (if awarded the Contract) represented by an Agent in that country who is equipped and able to carry out the Bidder's maintenance, technical support, training, and repair obligations prescribed in the General and Particular Conditions of Contract, and/or Purchaser's Requirements. An Agent, acceptable to the Purchaser, shall be established prior to contract signature.</p> <p>This condition may be relaxed. JV/ association may appoint its authorized representative.</p>	<p>No.</p> <p>The requirements are as clearly specified in the Bidding Document. No conditions are to be relaxed or removed.</p>
14	Sec. II, Instructions to Bidders	<p>6.1 (a)</p> <p>The Bidder should demonstrate experience in the design, supply and installation of data center, communication network and disaster recovery. The Bidder shall have successfully implemented these systems in the last five (5) years at an enterprise of an equivalent size, growth rate, complexity, and stature of ECG (i.e. 3,000,000 customers).</p>	<p>No.</p> <p>The requirements are as clearly specified in the Bidding Document. No conditions are to be relaxed or removed.</p>

SI	Ref	Question	Answer
		<p>This condition may be relaxed. The requirement for 3 references may be relaxed to 1. Also the condition of successfully implemented in last 5 years may be removed.</p> <p>Additionally the requirement defined in ITB 6.1 (a) are in contradiction to Qualification desired in Section III, Bid Review, Evaluation Criteria and bidder qualification requirement, Clause 4.4.3 Specific Experience in Key Activities. Please clarify</p>	<p>The experience requirements of 6.1 (a) and 4.4.3 are at two different levels.</p> <p>Section 4.4.3 of the Bidder Qualification Requirement relates to Specific Experience in the listed Key Activities thereof and the experience requirement is not the same as the experience requirement for the complete design, supply and installation of data center, communication network and disaster recovery of 6.1 (a).</p> <p>Kindly note the difference.</p>
15	Sec. II, Instructions to Bidders	<p>6.1 (a)</p> <p>The Bidder should demonstrate experience in installation of communication network with SCADA integration in an energy company in the size or more of ECG in the past five years.</p> <p>This clause is a restrictive as the major work is for datacentre. The clause may be removed.</p>	<p>No.</p> <p>The requirements are as clearly specified in 6.1 (a) of the Bidding Document.</p> <p>No conditions are to be relaxed or removed. A Utility company is unique and different from most companies in that it plays a vital and strategic part of a country. It has services such as SCADA that one would not find in other traditional enterprises.</p> <p>This requirement cannot be removed.</p>
16	Section II, Bid Data Sheet	<p>E. Bid opening &amp; Evaluation</p> <p>ITB 28.7 (d) The discount rate is 5%</p> <p>Please clarify</p>	<p>The discount rate is for evaluation purposes only to be used for the Net Present Value calculation of recurrent cost.</p>

SI	Ref	Question	Answer
17	Section VII. Purchaser's Requirements	<p>1.1 Stakeholders</p> <p>Business Objectives of the Purchaser: ECG's communication wide area network already covers all its Head Office and annexes to the Head Office, regional offices, warehouses, and eighty (80) district offices across its operational area.</p> <p>Details of all these sites along with specific requirement, if any may be indicated.</p>	<p>The number of remote sites is 120. The details and specification of the sites are given in Section VII of the Bidding Document.</p>
18	Section VII. Purchaser's Requirements	<p>System Inventory Table</p> <p>Communication Hardware and Software</p> <p>Quantity and count of remote sites has not been provided.</p>	<p>Kindly refer to Answer to Question No. 9 above.</p>
19	Section VII. Purchaser's Requirements	<p>2.1.3 Data Center Interconnect (DCI)</p> <p>ECG will manage the deployment of the DCI link.</p> <p>Interface of these links may be provided along with that for Nine regions. It is understood that ECG shall be providing the links between all the sites.</p>	<p>The regions already have connectivity to the WAN. No other links are planned for the regional sites. ECG will increase bandwidth where necessary and provide the DCI fiber between the primary and secondary DC.</p>
20	Section VII. Purchaser's Requirements	<p>Storage for data center</p> <p>Tentative/ minimum storage requirement as per the traffic may be indicated for having baseline for evaluation.</p>	<p>'As-is' situation is now provided in Amendment 7 – Storage for Data Center.</p> <p>There are ongoing projects: OMS, MMS, ERP, GIS which will have their respective storage requirements for the future.</p>

SI	Ref	Question	Answer
21	Section VII. Purchaser's Requirements	<p>SCADA and Metering Partner</p> <p>Details for the existing infrastructure etc. for SCADA and Metering Partner along with the requirement from bidder may be provided.</p>	<p>We cannot answer this question until the OMS and MMS designs are completed and only at the detailed design stage of this project.</p> <p>We do not have zones for metering and SCADA. We have Internet, DMZ, WAN and Interconnect zones.</p>
22	Section VI. Particular Conditions of Contract	<p>Training</p> <p>Training requirement in terms of minimum no. of participants, frequency of training etc. may be defined for having baseline for evaluation</p>	<p>Training requirement is now provided in Amendment 4 - Training.</p> <p>The Bidder response should however provide detailed components addressing training needs for a successful hand over of the Data Center to ECG, and these figures given in the price schedules and the respective training areas may be modified with justifications.</p>
23	Section VII: UPS: All DC and DR	<p>Is there any existing UPS at both the DC sites and one DR site? If yes what are the specifications.</p>	<p>There is a 100KVA UPS at the primary, and no UPS at the DR site.</p> <p>And 40KVA centralized UPS, backup with 5KVA on each rack at DC and 5KVA on each rack at Legon DR.</p> <p>Bidders are to refer to B 1.1.1 of Section VII-Purchaser's Requirements, for further details relating to the project power supply requirements.</p>

SI	Ref	Question	Answer
24	Section II: Bid Data Sheet, page 45 of the RFP.	<p>It is stated that a bidder is supposed to have ISO 9001 and ISO 27001 to qualify for the eligibility criteria.</p> <p>We would like to find out whether aside the stated ISO Certifications a bidder can go ahead and submit a proposal if they have one of these standards and a different ISO standard for example ISO 20000.</p>	The requirement must be strictly complied with.
25		Please indicate the floor height from bare floor to the Ceiling? What is the room space for the ceiling void?	<p>Purchaser estimates Ceiling height of 3m, and no ceiling void.</p> <p>However, pursuant to ITB sub-clause 8.1, Bidder may wish to visit and examine the site or sites and obtain for itself, at its own responsibility and risk, all information that it may deem necessary for preparing the Bid.</p>
26		Which type of ceiling is in place?	<p>Purchaser estimates concrete slab.</p> <p>However, pursuant to ITB sub-clause 8.1, Bidder may wish to visit and examine the site or sites and obtain for itself, at its own responsibility and risk, all information that it may deem necessary for preparing the Bid.</p>
27		What type of Windows and Doors are in place?	<p>Purchaser estimates glass windows and fireproof doors.</p> <p>However, pursuant to ITB sub-clause 8.1, Bidder may wish to visit and examine the site or sites and obtain for itself, at its own responsibility and risk, all information that it may deem necessary for preparing the Bid.</p>
28		Which floor type are in place?	<p>Purchaser estimates that the Primary DC has a raised floor, and the secondary DC has rails on top.</p> <p>However, pursuant to ITB sub-clause 8.1, Bidder may wish to visit and examine the site or sites and obtain for itself, at its own responsibility and risk, all information that it may deem</p>



SI	Ref	Question	Answer
			necessary for preparing the Bid.
29		Are there partitions within the Data Centre? Please indicate and give dimensions (L, B & H)for each partitions	Yes. Kindly refer to the rooms drawings in the Bidding Document for details in Section VII Purchaser's Requirements.
30		What type of raise floor tiles are in place? What is the height?	Purchaser estimates standard type tiles with Height 30cm.  However, pursuant to ITB sub-clause 8.1, Bidder may wish to visit and examine the site or sites and obtain for itself, at its own responsibility and risk, all information that it may deem necessary for preparing the Bid.
31		How many servers are in place and fully populated at the Primary and Secondary Data Centres	115 No. physical servers (Primary Site), 6 No. physical servers (Secondary Site)
32		What type of servers are installed? Provide specifications, rating etc Indicate how many are virtualized etc	<p><b>Dell PowerEdge</b>  System Manufacturer Dell Inc.  System Model PowerEdge R730xd  System Type x64-based PC  Processor Intel(R) Xeon(R) CPU E5-2690 v3 @ 2.60GHz, 2600 Mhz, 12 Core(s), 24 Logical Processor(s)  Processor Intel(R) Xeon(R) CPU E5-2690 v3 @ 2.60GHz, 2600 Mhz, 12 Core(s), 24 Logical Processor(s)  BIOS Version/Date Dell Inc. 1.0.4, 8/28/2014  SMBIOS Version 2.8  BaseBoard Manufacturer Dell Inc.  Hardware Abstraction Layer Version = "10.0.14393.2068"  Total Physical Memory 192 GB</p> <p><b>Hp ProLiant DL380 Gen</b>  System Manufacturer HPE  System Model ProLiant DL380 Gen10  System Type x64-based PC  System SKU 868704-B21</p>

SI	Ref	Question	Answer
			<p>Processor Intel(R) Xeon(R) Gold 6142 CPU @ 2.60GHz, 2594 Mhz, 16 Core(s), 32 Logical Processor(s)  Processor Intel(R) Xeon(R) Gold 6142 CPU @ 2.60GHz, 2594 Mhz, 16 Core(s), 32 Logical Processor(s)  SMBIOS Version 3.1  Embedded Controller Version 1.20  BaseBoard Manufacturer HPE  Locale United States  Hardware Abstraction Layer Version = "10.0.14393.2068"  Total Physical Memory 256 GB</p> <p><b>Lenovo/IBM</b>  System Manufacturer LENOVO  System Model System x3650 M5: -[8871AC1]-  System Type x64-based PC  Processor Intel(R) Xeon(R) CPU E5-2603 v4 @ 1.70GHz, 1700 Mhz, 6 Core(s), 6 Logical Processor(s)  BIOS Version/Date LENOVO -[TCE130J-2.40]-, 4/11/2017  SMBIOS Version 3.0  BaseBoard Manufacturer LENOVO  Hardware Abstraction Layer Version = "10.0.14393.2068"  Total Physical Memory 31.2 GB</p> <p><b>Huawei RH2288H v3.</b>  Intel® Xeon® E5-2600 v3 processors  Memory  64GB  16 DDR4 RDIMMs  Internal Storage  Four of 300GB front 2.5-inch SAS HDDs</p> <p>57No. virtualized (21no. VMware eXSi, 3no. citrix xenserver, 33no. Microsoft Hyper-V)</p>
33		What type of Cable management installed for servers, Data and Power Cables	The legacy DC cabling management is not to be touched for this project.

SI	Ref	Question	Answer
34		Which type of PDU's are installed? How many are installed .Provide specifications etc	Rack PDU; basic vertical (0U) 208v 60amps (200-240vac) There are two (2) PDU's in each rack
35		What type of network devices are installed? Is there MPLS in place ? Provide their specifications for routers, switches etc. How many ISP are providing service for the network	Network devices are Microtik routers and switches, no MPLS. There are 3 ISP used today.
36		What is the capacity of the dedicated fibre optic connectivity to the Data Centre. What is the capacity of the backup link	This is dark fiber, so the capacity is limited by the edge devices network ports capacities.  There are 2No. 10G ECG fiber links from Projects Office (Primary Site) to Legon (Secondary Site). The backup link is a 45Mbps leased fiber link from Telcos.
37		What is the capacity of PABX device installed? Provide brand , number of ports, functionalities. Is there VOIP system in place?	As specified within Section VII, C2.2.3.12 & 2.2.3.13, the existing PBX will be replaced with an IP based telephony and multi-media system provided under this Contract. This new system shall be provided for the entire ECG enterprise.
38		Provide number of dedicated power grid connected to the Data Centre, capacity etc	One – two dedicated feeder.
39		What is the Public Utility ( Transformer Capacity)	There Are Two (2) Distribution Transformers Serving The Data Center; Transformer One (T1) – 500 KVA Transformer Two (T2) – 315 KVA

SI	Ref	Question	Answer
40		What is the Genset Capacity installed for the Data Centre, type etc	There Are Two (2) Power Generators Serving The Data Center Generator One (G1) – 80 KVA Generator Two (G2) – 44 KVA
41		Provide configuration details i.e incoming breakers, number of outgoing and ratings etc	There are four (4) incoming breakers (400-280 AMPS). Two at the supply intake point and another two at the end of the feeder cable where the surge arrester is connected
42		What type of ATS is installed, capacity, setup, etc	2 X 2 input, with dual output; 2 x 250amps dual input
43		What type of cable was used on the ATS, size and length	All incoming and outgoing cables used on the ATS are armored cables ranging between 95mm <sup>2</sup> and 35mm <sup>2</sup>
44		What is the earthing position? Type of cables used and their capacity etc	70mm <sup>2</sup> yellow/green insulated copper cable
45		How many earthing bars are installed	Two earthing bars.
46		What is the size of the down conductor?	70mm <sup>2</sup> yellow/green insulated copper cable..

SI	Ref	Question	Answer
47		Which cooling system are installed? Capacity of unit, brand etc. . Where is the source of powering for the units	<p><u>Primary Site</u> Centralized Cooling System: 2 x 10hp LG Split Type: 6 x 5hp LG; 2 x 2.5hp Fujitech; 1 x 2.5hp LG</p> <p><u>Secondary Site</u> Split Type: 4 x 2.5hp LG.</p> <p>Power source is from the grid and the Genset in case of outage.</p>
48		What type of Surge Arrestors are installed? Provide their capacity etc, how many. How is configured	2 x 3-Phase EATON surge arresters @ 160KA. The surge arresters are connected midway between the distribution transformers and the ATS unit
49		What type of ceiling lightening system is installed? Are there Recess light? What is the dimension	The ceiling lightening system installed are surface mount, 2 feet/ twin led lighting fixtures.
50		Type of Access Control are in place and how many , brand, storage capacity etc	Biometric: 5No. Installed (Primary Site and Secondary Site), Brand: ZKT Eco. Storage: 250GB RAM: 8GB
51		What type of Surveillance System is installed, specifications etc, how many Cameras are installed, what is their range of covering?	HKVISION NETDVR: 9No. Installed. Covers Monitoring Room, Primary Site, Utility Room, Corridor and GENSET at (6 Primary Site and 3 Secondary Site).
52		Is there DCIM installed? Provide details	No.

SI	Ref	Question	Answer
53		IS there BMS installed? Provide details	No.
54		What is the Cylinder Capacity for the Fire Suppression System? Which fire suppression system is installed? How many fire detectors are installed	148 kilos Gas Suppression System (Primary Site), 8 fire detectors 148 kilos Gas Suppression System (Secondary Site), 3 fire detectors.
55		Does the fire suppression system covers the utility and monitoring rooms?	Yes.
56	Section II. Bid Data Sheet ITB 16.2 ©	Is the "Technical Approach and Methodology" means High level design or detail technical method of all the new system?	The Technical Approach and Methodology must describe the technical approach clearly showing how you will go about the implementation of the project with its various steps defines.
57	Section II. Bid Data Sheet ITB 16.2 ©	What is the "Migration of Existing Systems" scope? What does the existing system need to be migrated?	One of the objectives is to provide hosting capacity in the new infrastructure so that existing system could be moved to the new environment with proven system migration techniques. Knowing that some legacy may not be movable, we expect in these cases migration at the network level into the new environment with the appropriate security measures.
58	Section VI. Particular Conditions of Contract GCC 1.1 (n) & GCC 1.1 (tt)	There is a requirement in GCC 1.1(n) of <b>Warranty Period of 36 Months</b> There is another description of <b>Post-Warranty Services Period is 24 months.</b> What's the different and between warranty and post-warranty? What's the relationship between warranty and post-warranty?	The warranty services starts from the day of Operational Acceptance of the system and the post warranty starts at the expiration of the warranty obligations.  The post-warranty period follows immediately after the warranty period.

SI	Ref	Question	Answer
59	1.1.1.1 PROJECT OFFICE – PRIMARY DATA CENTER	What is the live load for project office DC?	2208 KWh per day.
60	1.1.1.2 LEGON – SECONDARY DATA CENTER	What is power density for secondary DC? What is the live load for secondary DC?	We will provide during detailed design stage.
61	1.1.1.3 KUMASI - DATA RECOVERY Room Power	What is power density for Kumasi DC	Zero.
62	1.1.2 HVAC	Can you please provide existing Racks' height, appearance and cabling for better to install Separators of the hot and cold aisles	<p>Visit was provided to cover these questions. Future visits can be organized for winners.</p> <p>However, Bidder may wish to visit and examine the site or sites and obtain for itself, at its own responsibility and risk, all information that it may deem necessary for preparing the Bid, pursuant to ITB 8.1.</p>

SI	Ref	Question	Answer
63	Network design between DC and branch	How about the connectivity status and planning between the data center network and other branches network, is there any update requirement of network for each branch?	Remote site LAN are out of scope.
64	Section VII. PURCHASER'S REQUIREMENTS (INCLUDING IMPLEMENTATION SCHEDULE) 2.2.3.12 CENTRALIZED COMMUNICATION MANAGER	<p>The unified communications managers will replace the existing PBX,</p> <ol style="list-style-type: none"> <li>1. Dose the existing IP phones or analogue phones need to register in new system? If needed, how many existing IP phone and how many existing analogue phone? What is brand and model of those phone?</li> <li>2. There is the instant message function in the CENTRALIZED COMMUNICATION MANAGER, how many IM users would be in the system?</li> <li>3. How many concurrent voice conference would be in the new system?</li> <li>4. How many concurrent void mail and fax mail would be in the new system?</li> </ol>	<p>Existing headsets will be replaced.</p> <p>All terminal capable of IM are expected to be activated. We don't have a hard number in mind and will welcome a proposition based on the total number of video conference terminals, communication manager capacity and best practice.</p> <p>We do not have a hard number in mind and will welcome a proposition based on the total number of users, communication manager capacity and best practice. The system must be provisioned to not allow blocking when leaving a voice mail or sending a fax.</p>
65	Section VII. PURCHASER'S REQUIREMENTS (INCLUDING IMPLEMENTATION SCHEDULE) 2.2.3.13 REMOTE COMMUNICATION MANAGER	<ol style="list-style-type: none"> <li>1. What's the number of the remote site?</li> <li>2. How many user in different remote site, if the user include IM, then, how many IM users would be in different remote site?</li> <li>3. How many concurrent void conference would be in different remote site?</li> <li>4. How many concurrent void mail and fax mail would be in different remote site?</li> </ol>	<ol style="list-style-type: none"> <li>1 Number of remote sites is 120</li> <li>2 Average number of terminals per remote site is 8</li> <li>3 We don't have a hard number in mind and will welcome a proposition based on the total number of video conference terminals, communication manager capacity and best practice</li> <li>4 We don't have a hard number in mind and will welcome a proposition based on the total number of users, communication manager capacity and best practice. The system must be provisioned to not allow blocking when leaving a voice mail or sending a fax</li> </ol>



SI	Ref	Question	Answer
66	2.2.3.14 HIGH-END VIDEO-CONFERENCE SYSTEM	<ol style="list-style-type: none"> <li>1. What is the function of Smart Screen?</li> <li>2. How much the bandwidth of ECG HQ?</li> </ol>	<p>1 Smart screen are screens capable of synchronizing with the source in order to update the source, like a laptop screen, with move moves, color changes, edition directly from the screen.</p> <p>HQ bandwidth: HQ to Project Office:  Link1:30M  Link 2:10M</p> <p>2 ECG may provide the current bandwidth for ECG HQ?</p>
67	2.2.3.15 MID-RANGE VIDEO-CONFERENCE SYSTEM	<ol style="list-style-type: none"> <li>1. What's the number of the regional offices?</li> <li>2. How much the bandwidth of each regional office?</li> <li>3. What's the address of the each regional offices?</li> </ol>	<ol style="list-style-type: none"> <li>1. There is a total of nine (9) Regional Offices: Accra East, Accra West, Ashanti SBU HQ, Ashanti Adum Office, Central, Eastern, Tema, Volta, and Western.</li> <li>2. For bandwidth Refer to Amendment 8</li> <li>3. For address Refer to Amendment 9</li> </ol>
68	2.2.3.16 HIGH-END PHONES HANDSETS	<ol style="list-style-type: none"> <li>1. What's the number of the HIGH-END PHONES HANDSETS for each branches office?</li> <li>2. What's the address of the each branches office?</li> <li>3. Is there a POE port for the HIGH-END PHONES HANDSETS installation? What's the length of network cable for installation of HIGH-END PHONES HANDSETS?</li> </ol>	<ol style="list-style-type: none"> <li>1. See Amendment 3- Equipment Count</li> <li>2. See Amendments 9 &amp; 10.</li> <li>3. There will be PoE ports for every handset and the PoE switches will be placed in locations to ensures cabling distances are within the maximum allowed for PoE</li> </ol>

SI	Ref	Question	Answer
69	2.2.3.18 LOW-END PHONES HANDSETS	<ol style="list-style-type: none"> <li>1. What's the number of the LOW-END PHONES HANDSETS for each branches office?</li> <li>2. What's the address of the each branches office?</li> <li>3. Is there a POE port for the LOW-END PHONES HANDSETS installation? What's the length of network cable for installation of LOW-END PHONES HANDSETS?</li> </ol>	Kindly refer to Answer to Question 68 immediately above.
70	2.2.3.19 MID-RANGE PHONES HANDSETS	<ol style="list-style-type: none"> <li>1. What's the number of the MID-RANGE PHONES HANDSETS for each branches office?</li> <li>2. What's the address of the each branches office?</li> <li>3. Is there a POE port for the MID-RANGE PHONES HANDSETS installation? What's the length of network cable for installation of MID-RANGE PHONES HANDSETS?</li> </ol>	Kindly refer to Answer to Question 68 above.
71	General network questions	From the description in the document, we consider the fiber connects 10 district center and form a ring as the backbone transmission network, is it correct?	<p>Question lack clarity, not sure what is being asked.</p> <p>But ECG's Primary WAN consist of leased shared capacities (ring) from a two (2no.) telcos for long haul communications between operation regions and ECG district offices, This is complemented by ECG's own fiber links and microwave links (Secondary WAN) on the unallocated frequencies for local distribution in the main cities.</p>
72	4.17 Form DCCN -6 Data Center Core Switches	IP SLA Please explain what is the "IP SLA" feature?	Internet protocol service level agreement.

SI	Ref	Question	Answer
73	4.17 Form DCCN -6 Data Center Core Switches	<p>Dynamic Packet Prioritization (DPP) to prioritize small flows over large flows, helping ensure that small flows are not affected excessive queuing to accommodate large flows</p> <p>Please help to explain this requirement</p>	The Bidder is expected to know or research.
74	4.17 Form DCCN -6 Data Center Core Switches	<p>“Backplane must deliver up to 100 Tbps of non-blocking performance with a latency of less than 5 microseconds, enabling data center customers to create a robust network structure that can scale to 200x10 and 25 Gigabit Ethernet ports.”</p> <p>Client request the device more than 4 IO module, but all the IP company can't provide the device own 90t forwarding capacity with 4 IO module, Actually only quantity of IO module more than 8 that can provide more than 90t forwarding capacity</p>	This is about backplane capacity, not IO. Regardless, Form DCCN-6 specifies “at least 4 I/O Modules” so more can be provided as necessary to achieve a fully functional system as specified.
75	4.19 Form DCCN -8 Data Center Access Switches	<p>General Descriptive Requirement :</p> <p><input type="checkbox"/> High-density, High performance, data-CENTER-class, <b>1/10</b> Gigabit Ethernet switches that supports any transport over an Ethernet-based fabric, including Layer 2 and Layer 3 traffic.</p> <p>Dose “1/10” means 100M/1G Gigabit?</p>	No. It means: 1G/10G.

SI	Ref	Question	Answer
76	4.20 Form DCCN -9 Data Center WAN HBR Routers	<p>“IPsec, NAT, DMVPN”</p> <p>What are these features used for?</p> <p>Does the data center export need to do encryption or NAT?</p>	<p>The Bidder is expected to know or research.</p> <p>What does “data center export” mean?</p> <p>Encryption and NAT will be done as needed and depending on the solution proposed.</p>
77	General network questions	<p>Whether it involves the interconnection of NMS, or supplier needs to provide a separate network management server?</p>	<p>NMS is required. Kindly refer to Section VII, C2.3 of the Bidding Document.</p>
78	General network questions	<p>What’s the kind of authentication mode for access users, is a new authentication server needed?</p>	<p>TACACS/Radius with server.</p>
79	General network questions	<p>Is a log server needed for the network system?</p>	<p>Yes.</p>
80	General network questions	<p>Whether each node of the network device needs to consider the redundancy solution?</p>	<p>At DC’s. Yes.</p>

SI	Ref	Question	Answer
81	2.2 DETAILED TECHNICAL SPECIFICATIONS	"The management solution should provide server backup and restore capabilities ", what data to be backup and restore, the configuration of the server or the data of the guest OS running on the server?	Both.
82	General IT questions	Do you want to manage the three data center in a unified management platform?	Yes.
83	General IT questions	Does the vender need to provide the disaster recovery capabilities for VM?	Yes.
84	General IT questions	What is the service relationship between the three data centers? For example, an application cluster is deployed across sites, or a separate application is deployed at different sites and then disaster-tolerant to other sites through the capabilities of the application.	Primary and Secondary are expected to run in active/active mode, providing back to each other in real time. The DR will back the primary and secondary and ready for loading specific VM and data when DR is declared
85	General IT questions	About SDN, do you need the SDN controller to control all of the network provisioning including the network of virtual machine, or just the auto-configuration of the network device?	All network devices must be SDN compatible.

SI	Ref	Question	Answer
86	2.2.2.1 SDS Management software	What's the meaning of ABS, what's the function of Volume Groups, means mass allocation LUN used for the host?	<p>ABS is a typo. It is actually SDS.</p> <p>The Bidder is expected to know or otherwise research the function of VG in SDS.</p>
87	4.13 Form DCCN -2 Data Center Host Servers	What's the capacity of modular storage array and what's the business needed to support, what's the performance requirement of the business?	There is no set capacity defined, Bidder will size them based on cost/capacity and total storage requirement.
88	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution should provide simple and effective centralized management for VM templates, virtual appliances, ISO images and scripts. Containerized workloads and services management,"</p> <p>What is the scripts using for? To inject in the VM or just for the management?</p> <p>Does "Containerized workloads" mean that the solution need to provide container service?</p>	Both.
89	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution must provide VM machine mobility by providing clusters that span two DC</p> <p>Does it mean that provide VM online migration between two DC? "</p>	Yes.

SI	Ref	Question	Answer
90	4.13 Form DCCN -2 Data Center Host Servers	<p>"Configuration changes and automatically alert the system administrators if a host falls out of compliance."</p> <p>What kind of configuration to be changes? Alert the system administrator by mail? Or just a see alarm on the management platform.</p>	Both are required.
91	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution should support workload balancing whether automated or manual. The solution should provide a dashboard for workload planning and balancing."</p> <p>Does it means that need a portal for VM provisioning, and automatic backend balancing between different servers and storage. Or you want to configure the workload of VM provisioning and configure the policy of the balancing?</p>	Bidder shall propose the best fit configuration to the solution proposed so as to fulfill the requirements as defined in the Bidding Document.
92	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution must be able to avoid application downtime for planned storage maintenance by migrating live virtual machine disk files across storage arrays"</p> <p>Does it include two suites of storage of the VM cluster? If yes, is it ok to automatic synchronize date between the two storage, you can planned storage maintenance with no data loss or downtime.</p>	No data loss or downtime during storage maintenance.
93	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution must deliver storage-efficient backups, de-duplication, rapid recovery and WAN-optimized replication for DR."</p> <p>Do you really need De-duplication and WAN-optimized which cause the performance down?</p>	Yes.

SI	Ref	Question	Answer
94	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution must be able to provide continuous availability of any application in the event of a hardware failure – with no data loss or downtime."</p> <p>Does the "hardware" include the storage and server? If VM only running on one server and one storage, failure of this server or storage will cause downtime.</p>	The design must meet the requirement.
95	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution must provide efficient, array-agnostic replication of virtual machine data over the LAN or WAN. The solution should be able to support replication at the virtual machine–level."</p> <p>Does it mean that backup the virtual machine?</p>	Yes. Backup of both VM and data.
96	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution must provide capability for encryption for VM data and disks"</p> <p>What is the scenario? Encryption of disk will cause the performance down, is it OK while the platform Isolate disks of different tenants to ensure security.</p>	<p>Data encryption <i>capability</i> is required for VM data and disks, as specified.</p> <p>Other encryption must be provided, as specified elsewhere in the Bidding Document.</p>
97	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution must have support for High Availability across two data centers"</p> <p>Is it high availability for VM, or including hardware equipment?</p>	Both.
98	Section II. Bid Data Sheet ITB 16.2 ©	Is the "Technical Approach and Methodology" means High level design or detail technical method of all the new system?	Kindly refer to Answer to Question No. 56 above.



SI	Ref	Question	Answer
99	Section II. Bid Data Sheet ITB 16.2 ©	What is the "Migration of Existing Systems" scope? What does the existing system need to be migrated?	Kindly refer to Answer to Question No. 57 above.
100	Section VI. Particular Conditions of Contract GCC 1.1 (n) & GCC 1.1 (tt)	There is a requirement in GCC 1.1(n) of <b>Warranty Period of 36 Months</b> There is another description of <b>Post-Warranty Services Period is 24 months.</b> What's the different and between warranty and post-warranty? What's the relationship between warranty and post-warranty?	Kindly refer to Answer to Question No. 58 above.
101	1.1.1.1 PROJECT OFFICE – PRIMARY DATA CENTER	What is the live load for project office DC?	Kindly refer to Answer to Question No. 59 above.
102	1.1.1.2 LEGON – SECONDARY DATA CENTER	What is power density for secondary DC? What is the live load for secondary DC?	Kindly refer to Answer to Question No. 60 above.
103	1.1.1.3 KUMASI - DATA RECOVERY Room Power	What is power density for Kumasi DC	Kindly refer to Answer to Question No. 61 above.
104	1.1.2 HVAC	Can you please provide existing Racks' height, appearance and cabling for better to install Separators of the hot and cold aisles	Kindly refer to Answer to Question No. 62 above.

SI	Ref	Question	Answer
105	Network design between DC and branch	How about the connectivity status and planning between the data center network and other branches network, is there any update requirement of network for each branch?	Kindly refer to Answer to Question No. 63 above.
106	Section VII. PURCHASER'S REQUIREMENTS (INCLUDING IMPLEMENTATION SCHEDULE) 2.2.3.12 CENTRALIZED COMMUNICATION MANAGER	<p>The unified communications managers will replace the existing PBX,</p> <ol style="list-style-type: none"> <li>5. Dose the existing IP phones or analogue phones need to register in new system? If needed, how many existing IP phone and how many existing analogue phone? What is brand and model of those phone?</li> <li>6. There is the instant message function in the CENTRALIZED COMMUNICATION MANAGER, how many IM users would be in the system?</li> <li>7. How many concurrent voice conference would be in the new system?</li> <li>8. How many concurrent void mail and fax mail would be in the new system?</li> </ol>	Kindly refer to Answer to Question No. 64 above.
107	Section VII. PURCHASER'S REQUIREMENTS (INCLUDING IMPLEMENTATION SCHEDULE) 2.2.3.13 REMOTE COMMUNICATION MANAGER	<ol style="list-style-type: none"> <li>1. What's the number of the remote site?</li> <li>2. How many user in different remote site, if the user include IM, then, how many IM users would be in different remote site?</li> <li>3. How many concurrent void conference would be in different remote site?</li> <li>4. How many concurrent void mail and fax mail would be in different remote site?</li> </ol>	Kindly refer to Answer to Question No. 65 above.

SI	Ref	Question	Answer
108	2.2.3.14 HIGH-END VIDEO-CONFERENCE SYSTEM	<ol style="list-style-type: none"> <li>1. What is the function of Smart Screen?</li> <li>2. How much the bandwidth of ECG HQ?</li> </ol>	Kindly refer to Answer to Question No. 66 above.
109	2.2.3.15 MID-RANGE VIDEO-CONFERENCE SYSTEM	<ol style="list-style-type: none"> <li>1. What's the number of the regional offices?</li> <li>2. How much the bandwidth of each regional office?</li> <li>3. What's the address of the each regional offices?</li> </ol>	Kindly refer to Answer to Question No. 67 above.
110	2.2.3.16 HIGH-END PHONES HANDSETS	<ol style="list-style-type: none"> <li>1. What's the number of the HIGH-END PHONES HANDSETS for each branches office?</li> <li>2. What's the address of the each branches office?</li> <li>3. Is there a POE port for the HIGH-END PHONES HANDSETS installation? What's the length of network cable for installation of HIGH-END PHONES HANDSETS?</li> </ol>	Kindly refer to Answer to Question No. 68 above.
111	2.2.3.18 LOW-END PHONES HANDSETS	<ol style="list-style-type: none"> <li>1. What's the number of the LOW-END PHONES HANDSETS for each branches office?</li> <li>2. What's the address of the each branches office?</li> <li>3. Is there a POE port for the LOW-END PHONES HANDSETS installation? What's the length of network cable for installation of LOW-END PHONES HANDSETS?</li> </ol>	Kindly refer to Answer to Question No. 69 above.

SI	Ref	Question	Answer
112	2.2.3.19 MID-RANGE PHONES HANDSETS	<p>1. What's the number of the MID-RANGE PHONES HANDSETS for each branches office?</p> <p>2. What's the address of the each branches office?</p> <p>3. Is there a POE port for the MID-RANGE PHONES HANDSETS installation? What's the length of network cable for installation of MID-RANGE PHONES HANDSETS?</p>	Kindly refer to Answer to Question No. 70 above.
113	General network questions	From the description in the document, we consider the fiber connects 10 district center and form a ring as the backbone transmission network, is it correct?	Kindly refer to Answer to Question No. 71 above.
114	4.17 Form DCCN -6 Data Center Core Switches	<p>IP SLA</p> <p>Please explain what is the "IP SLA" feature?</p>	Kindly refer to Answer to Question No. 72 above.
115	4.17 Form DCCN -6 Data Center Core Switches	<p>Dynamic Packet Prioritization (DPP) to prioritize small flows over large flows, helping ensure that small flows are not affected excessive queuing to accommodate large flows</p> <p>Please help to explain this requirement</p>	Kindly refer to Answer to Question No. 73 above.

SI	Ref	Question	Answer
116	4.17 Form DCCN -6 Data Center Core Switches	<p>“Backplane must deliver up to 100 Tbps of non-blocking performance with a latency of less than 5 microseconds, enabling data center customers to create a robust network structure that can scale to 200x10 and 25 Gigabit Ethernet ports.”</p> <p>Client request the device more than 4 IO module, but all the IP company can't provide the device own 90t forwarding capacity with 4 IO module, Actually only quantity of IO module more than 8 that can provide more than 90t forwarding capacity</p>	Kindly refer to Answer to Question No. 74 above.
117	4.19 Form DCCN -8 Data Center Access Switches	<p>General Descriptive Requirement :</p> <p><input type="checkbox"/> High-density, High performance, data-CENTER-class, <b>1/10</b> Gigabit Ethernet switches that supports any transport over an Ethernet-based fabric, including Layer 2 and Layer 3 traffic.</p> <p>Dose “1/10” means 100M/1G Gigabit?</p>	Kindly refer to Answer to Question No. 75 above.
118	4.20 Form DCCN -9 Data Center WAN HBR Routers	<p>“IPsec, NAT, DMVPN”</p> <p>What are these features used for?</p> <p>Does the data center export need to do encryption or NAT?</p>	Kindly refer to Answer to Question No. 76 above.
119	General network questions	Whether it involves the interconnection of NMS, or supplier needs to provide a separate network management server?	Kindly refer to Answer to Question No. 77 above.
120	General network questions	What's the kind of authentication mode for access users, is a new authentication server needed?	Kindly refer to Answer to Question No. 78 above.

SI	Ref	Question	Answer
121	General network questions	Is a log server needed for the network system?	Kindly refer to Answer to Question No. 79 above.
122	General network questions	Whether each node of the network device needs to consider the redundancy solution?	Kindly refer to Answer to Question No. 80 above.
123	2.2 DETAILED TECHNICAL SPECIFICATIONS	"The management solution should provide server backup and restore capabilities ", what data to be backup and restore, the configuration of the server or the data of the guest OS running on the server?	Kindly refer to Answer to Question No. 81 above.
124	General IT questions	Do you want to manage the three data center in a unified management platform?	Kindly refer to Answer to Question No. 82 above.
125	General IT questions	Does the vender need to provide the disaster recovery capabilities for VM?	Kindly refer to Answer to Question No. 83 above.
126	General IT questions	What is the service relationship between the three data centers? For example, an application cluster is deployed across sites, or a separate application is deployed at different sites and then disaster-tolerant to other sites through the capabilities of the application.	Kindly refer to Answer to Question No. 84 above.

SI	Ref	Question	Answer
127	General IT questions	About SDN, do you need the SDN controller to control all of the network provisioning including the network of virtual machine, or just the auto-configuration of the network device?	Kindly refer to Answer to Question No. 85 above.
128	2.2.2.1 SDS Management software	What's the meaning of ABS, what's the function of Volume Groups, means mass allocation LUN used for the host?	Kindly refer to Answer to Question No. 86 above.
129	4.13 Form DCCN -2 Data Center Host Servers	What's the capacity of modular storage array and what's the business needed to support, what's the performance requirement of the business?	Kindly refer to Answer to Question No. 87 above.
130	4.13 Form DCCN -2 Data Center Host Servers	<p>“The solution should provide simple and effective centralized management for VM templates, virtual appliances, ISO images and scripts. Containerized workloads and services management,”</p> <p>What is the scripts using for? To inject in the VM or just for the management?</p> <p>Does "Containerized workloads" mean that the solution need to provide container service?</p>	Kindly refer to Answer to Question No. 88 above.

SI	Ref	Question	Answer
131	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution must provide VM machine mobility by providing clusters that span two DC</p> <p>Does it mean that provide VM online migration between two DC? "</p>	Kindly refer to Answer to Question No. 89 above.
132	4.13 Form DCCN -2 Data Center Host Servers	<p>"Configuration changes and automatically alert the system administrators if a host falls out of compliance."</p> <p>What kind of configuration to be changes? Alert the system administrator by mail? Or just a see alarm on the management platform.</p>	Kindly refer to Answer to Question No. 90 above.
133	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution should support workload balancing whether automated or manual. The solution should provide a dashboard for workload planning and balancing."</p> <p>Does it means that need a portal for VM provisioning, and automatic backend balancing between different servers and storage. Or you want to configure the workload of VM provisioning and configure the policy of the balancing?</p>	Kindly refer to Answer to Question No. 91 above.



SI	Ref	Question	Answer
134	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution must be able to avoid application downtime for planned storage maintenance by migrating live virtual machine disk files across storage arrays"</p> <p>Does it include two suites of storage of the VM cluster? If yes, is it ok to automatic synchronize date between the two storage, you can planned storage maintenance with no data loss or downtime.</p>	Kindly refer to Answer to Question No. 92 above.
135	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution must deliver storage-efficient backups, de-duplication, rapid recovery and WAN-optimized replication for DR."</p> <p>Do you really need De-duplication and WAN-optimized which cause the performance down?</p>	Kindly refer to Answer to Question No. 93 above.
136	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution must be able to provide continuous availability of any application in the event of a hardware failure – with no data loss or downtime."</p> <p>Does the "hardware" include the storage and server? If VM only running on one server and one storage, failure of this server or storage will cause downtime.</p>	Kindly refer to Answer to Question No. 94 above.

SI	Ref	Question	Answer
137	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution must provide efficient, array-agnostic replication of virtual machine data over the LAN or WAN. The solution should be able to support replication at the virtual machine-level."</p> <p>Does it mean that backup the virtual machine?</p>	Kindly refer to Answer to Question No. 95 above.
138	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution must provide capability for encryption for VM data and disks"</p> <p>What is the scenario? Encryption of disk will cause the performance down, is it OK while the platform Isolate disks of different tenants to ensure security.</p>	Kindly refer to Answer to Question No. 96 above.
139	4.13 Form DCCN -2 Data Center Host Servers	<p>"The solution must have support for High Availability across two data centers"</p> <p>Is it high availability for VM, or including hardware equipment?</p>	Kindly refer to Answer to Question No. 97 above.

SI	Ref	Question	Answer
140		<p>For both DR site and primary site, how much storage capacity and performance do you want to build, and if you have the requirement of the storage quantity or not, if yes, how many ?</p> <p>How many VMs do you want to build and what specification are they? Or how many servers do you want to build and what specification are they?</p>	<p>These details are to be agreed during the detailed design stage.</p> <p>The Bidder is to make a proposal to be evaluated to win.</p>
141	1.1.5 Data Center Connectivity	The CORE identifier in the topology, does it mean that the graph in the upper part is core or there is a core network below.	<p>Core pertains to network, what's below.</p> <p>Bidders are to submit a fully compliant solution as specified within the Bidding Document.</p> <p>Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the Bidding Document requirements.</p>
142	2.1.14 Communication Network	HAR is not included in the topology of Data Center Connectivity (P388) . But it is mentioned in the Communication Network .which position will the HAR be deployed?	<p>HAR are the CE routers.</p> <p>Refer to section: 2.1.14 Communication Network of the Purchaser's Requirement.</p>
143	1.1.2.5 DCIM: All DC	Which product will be responsible for DCIM?	The Bidder is expected to propose a compliant product in their solution.

SI	Ref	Question	Answer
144	2.1.2 Inter Zone Connectivity	There is no internal zone firewall in the Voice zone area according to the topology (p388), but a zone firewall is required according to the design requirements (Inter Zone Connectivity). Please confirm	<p>Bidders are to submit a fully compliant solution as specified in the Bidding Document.</p> <p>Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the Bidding Document requirements.</p>
145	System Inventory Table (Supply and Installation Cost Items)	According to the topology of P388, each zone will have its own firewall, but there is only one pair of internal firewalls, a pair of external firewalls, and a pair of SCADA firewalls in the device list. Is there a mistake with the firewall quantity?	<p>Bidders are to submit a fully compliant solution as specified within the Bidding Document.</p> <p>Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the Bidding Document requirements.</p>
146	Overall program	There are 6 aggregations and 20 accesses switches in the equipment list. It differs from the actual topology. Should the aggregation of voice and SCADA areas be access switches?	<p>Bidders are to submit a fully compliant solution as specified in the Bidding Document.</p> <p>Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the Bidding Document requirements.</p>
147	Overall program	How about the requirement of AGG switches in the VOICE zone, is there a special type of interface needed?	Bidders can propose their recommended solution that meets the specified requirements.

SI	Ref	Question	Answer
148	Overall program	<p>Currently, the number of firewalls in the DC topology does not match the number of devices in the price SCH3. We recommend that each layer be deployed with two layers of firewalls separately. The core side does not deploy firewalls.  -- Huawei's SDN solution is designed like this, Cisco is also the same.</p>	<p>Kindly refer to Answers to Questions No. 144 &amp; 145 above.</p>
149	2.1.9 SCADA Zone	<p>How to deploy VRF? Need to clarify</p>	<p>The Bidder is expected to know or research. This should be part of the Bidder's solution.</p>
150	2.1.10 Dev-Test	<p>This type of logically isolated deployment is not recommended and may result in security risks due to anomalies.</p>	<p>Functionality shall be provided as specified.   If the Bidder considers that any specified requirement is not necessary, or may introduce unwarranted concerns, then they are free to propose and highlight such issues in their proposal.</p>
151	2.1.13 Disaster Recovery (DR) and Price SCH11	<p>According to the topology design, the DR area shares a firewall between the WAN and the Internet. It is recommended to add firewalls for isolation. The number of devices in this part is inconsistent with the topology.</p>	<p>Kindly refer to Answers to Questions No. 144 &amp; 145 above.</p>
152	2.1.16 Security	<p>Which product will be deployed as RADIUS/TACACS server?</p>	<p>The Bidder is expected to propose a compliant product that best fits your solution.</p>

SI	Ref	Question	Answer
153	Project Office & Legon	The existing utility room has the space constrains to accommodate the new AVR,UPS, Batteries and LV panels, Kindly confirm if the ECG will make the necessary arrangements for the space allocation based on the new system designs ?	We believe there is need for extra space based on the information available to us today on ongoing Projects: GIS, OMS, ERP and especially MMS. Finding rooms for all the servers, AVR, UPS, Batteries, will be very challenging. We are reviewing but we cannot answer today.
154	Project Office	The current DC floor space contains 9 racks and as per the RFP the minimum racks should be 18. Looking at the floor space the existing space can accommodate only the 18 racks and there is necessary to find the additional space for the CRAC units, Kindly confirm if the ECG will make the necessary arrangements for the space allocation based on the new system designs?	Kindly refer to Answer to Question No. 153 above.
155	Project Office	As per the RFP page 375. Project office DC has one Genset that must be coupled with a new Genset to be procured in the contract for redundancy. The capacity of the existing generator is 80KVA and as part of the contract is 250KVA. The capacities mismatches and the existing Genset which will not meet the future load requirement in the data center. The number of generators should be 2X250KVA in this case ?	<p>Genset capacity will depend on your solution.</p> <p>Yes, the two gensets must match so that total load at any site can be accommodated by any Genset located there upon failure of one Genset.</p> <p><b>Note: Ignore the Genset KVA capacities in section: “System Inventory Table (Supply and Installation Cost Items”.) They were left unintentionally. As specified in section: 1.1.1 Power (P.375), “Provide enough prime power to fulfill the power need of the data centers”, The power rating of the Genset is left to the Bidder.</b></p>

SI	Ref	Question	Answer
156	All DC	Kindly confirm the estimate power density of the racks to calculate the total power & cooling capacity for sizing the UPS systems and CRAC (This can be the average capacity of 1 rack applicable for all the sites or in each location for the accuracy).	Power density will depend in part on the equipment you will propose in your solution.
157	All DC	As per the RFP Page 380. In addition to IT equipment, the UPS shall support all power required for the operation of the data center, which includes HVAC systems. Could you please confirm this point because the addition of HVAC systems make the higher capacity of UPS & Battery and are also not technically recommended to connect on the UPS systems hence the HVAC loads are inductive in nature?	Correct. HVAC should not be run through the UPS.
158	All DC	Please clarify the provision of HVAC systems for the Data center supported area especially the utility room which contains the AVR, UPS & Batteries?	This will depend on each DC. Bidders are to propose their solutions to ensure compliance with requirements is achieved.
159	Project Office	Please clarify the type of PDU existing at the rack, 3phase, 1 Phase, and basic, or metered?	Single Phase 208V (0U) @ 45-60AMP (200-250VAC) Metering is done on the main distribution board.
160		What is the minimum required memory for each Blade Node?	Bidders to refer to Section IV, Section 4.13, Form DCCN-2.

SI	Ref	Question	Answer
161		<p>Kindly advise the Complete <b><u>System details</u></b> which need be migrated on New Platform with operating system details: <b><u>System details</u></b>:-During meeting you were talking that old(Existing) physical server needs to be moved to new network so will you move physical server as well to new racks or only network. How many servers you want us to migrate to the new network? As well as how many physical servers you want us to convert in to virtual. (operating system information as well)</p> <p>Note that the underline is explaining what is mean by system details.</p>	<p>All D systems will need to be migrated to the new DC network. In addition, all existing servers and DB will need to be migrated to the new hosts and DB when possible. By possible we mean if the applications on the legacy servers can accommodate the required changes in order to move them to the new environment. For example does the application support VM?</p> <p>All will be determined during the detailed design.</p>
162		<p>System details which need to be relocated to new Racks.</p>	<p>Kindly see Answer to Question 161 immediately above.</p>
163		<p>Racks and server <b><u>allocation details</u></b> on each site: <b><u>Allocation details</u></b>:- There are 9 Racks and 4 Blade chassis are required as per BOM so how many racks and chassis will be placed to each site.</p> <p>Note that the underline is explaining what is mean by allocation details.</p>	<p>The depiction of the number of racks in the Bidding Document is inaccurate.</p> <p>This is corrected to:</p> <ol style="list-style-type: none"> <li>1. Project office 9 new racks (9 existing)</li> <li>2. Legon 5 new racks (3 existing)</li> <li>3. Kumasi 3 new racks (0 existing)</li> </ol>
164		<p>What is the required storage capacity, usable or raw?</p>	<p>300T raw but the actual will be determined at the detailed design stage of the project.</p>



SI	Ref	Question	Answer
165		What is the read/write ratio of the storage?	Target system must target a read/write ratio of 40/60.
166		We required a site visit to the project sites, especially Kumasi and Legon, kindly provide date and time we can visit all the project sites not limited to Kumasi and Legon.	After the initial Site visit, no more Site visit will be organised.
167		Since the solution is a Software define solution, should we ignore the stated blade chassis in the tender document?	We cannot comment. This will depend on the Bidder's solution.
168		If yes, to question 7, should we use the same compute memory and processor speed and cores?	Not necessarily as probably there will be more physical servers than blades; that is compute power will be more distributed.
169		Then, will you consider changing the server storage required so that everybody will be on the same page?	No. The storage on each server will depend on the total storage capacity needed and the number of servers proposed.
170		Is the warranty on all the hardware 3 years? If no, kindly state which ones should be 1 year and which ones should be 3 years.	Minimum of 3 years on all hardware.
171		Can everything be quoted in USD or there is a portion that should be quoted in GHS?	BDS ITB 15.1 of the Bidding Document specifies that "The currency (ies) of the Bid shall be as follows: <b>United States Dollars (USD) and/or Ghanaian Cedi</b> ".

SI	Ref	Question	Answer
172		BoM both for cables and any other infrastructure requirement, can we add a Column to the excel pricing sheet provided if know it is required but not requested for?	Yes.
173		Page 388 kindly explain this statement: - <i>One BMS shall be installed in each DC and each BMS shall manage all three sites.</i> Do you mean each BMS should be redundant to all the sites?	What is meant is that one BMS installed in each DC, and the two configured as a cluster (primary and secondary) to manage all DC, plus the DR, from either BMS node.
174		Is it mandatory for the Servers to do FCoE?	Yes.
175		What is the size of the Modular Storage Array?	Storage array may not be required as servers disks may be proposed for SDS.
176		Will the server connect to the storage using FCoE or ISCSI ?	Kindly refer to Answers to Questions No. 174 and 175 above.
177		What is the requirement for the Jump Server?	Bidders are to refer to Section VII, C2.1.7. The jump server will be used to connect to an external network.
178		Can we have the AutoCAD design of the data centers ?	No. The layouts have been provided in B 1.1.3 of Section VII – Purchaser’s Requirements.

SI	Ref	Question	Answer
179		Kindly confirm if you really need the Air Condition to be on UPS	Kindly refer to Answer to Question 157 above.
180		Can we have the physical details of the Kumasi DC?	Yes. This is now provided as Amendment- 6.
181		Can we have the structural integrity report on the three DC's ?	No.
182		Remote Site PBX are you referring to DEDICATED VOICE GATEWAY ROUTER in the tender document?	What is required is the router and PBX functionality at the remote sites.
183		Page 432 of the tender document: DEDICATED VOICE GATEWAY ROUTER, why is the quantity that much (Qty 120)?	120 is the number of remote sites.
184		On the excel file: Table SCH 13: column 1.13.2 it states Remote Site PBX, where is the specification, and why is the quantity 120?	120 is the number of remote sites. Kindly refer to Section VII – Purchaser’s Requirement in general and 2.2.3.12 in particular.

SI	Ref	Question	Answer
185		<p>About the Building management systems (BMS).</p> <ul style="list-style-type: none"> <li>- What are the equipment that needs to be a managed (Control) kindly list all.</li> <li>- We will require the building plan of all the locations that need the BMS.</li> </ul>	<p>The BMS shall manage the standard set of equipment associated with a Data Centre including, but not limited to, HVAC, Fire, Power, Access control, surveillance camera etc. Formal I/O listings will be developed and approved during detailed design.</p> <p>Location to monitor are Project Office, Legon, Kumasi.</p>
186		<p><b>UPS: All DC and DR</b></p> <p>The Supplier will be responsible for cabling between the UPS and the power supply switchboard providing the input power supply for the UPS. The UPS to the supply switchboard will be collocated in the same room. Suitable interlocks should be provided to ensure there are no closures on to faulted bus bars.</p> <p><input type="checkbox"/> In addition to IT equipment, the UPS shall support all power required for the operation of the data center, <b><u>which includes HVAC, lighting, signs.</u></b></p> <p><b>QUES: Kindly clarify whether the HVAC should also take its power from the UPS or rather the AVR</b></p>	<p>Kindly refer to Answer to Question 157 above.</p>
187		<p>The fiber link for DCI between the Project office and Legon office; will it be dark fiber i.e. dedicated fiber link?</p>	<p>Yes.</p>
188		<p>The details of the wireless IP Phone was not well spelt out. Kindly assist.</p>	<p>Please be specific, the specifications for the wireless IP Phone are in the Bidding Document, for example, in Section VII, C2.2.3.17.</p>

SI	Ref	Question	Answer
189		The wireless microphones for the conference room was requested but conference phones were not requested. Kindly assist.	Conference phones are not required hence not specified.
190		The quantities of the items under the section: Communication Hardware and Software was not stated. Please assist.	Kindly see the attached Amendments.
191	SECTION VII. ->0.2 Business Objectives of the Purchaser	<p>“Upgrade and Installation of additional ICT infrastructure at the existing DC sites”</p> <p>What is the scope of the Upgrade? Is there any equipment to reuse for the cloud platform? Or just create a new cloud platform and migrate the application to the cloud platform?</p>	Bidders to refer to B1.1 of Section VII-Purchaser's Requirements for details.
192	B. BUSINESS FUNCTION AND PERFORMANCE REQUIREMENTS->1.1 BUSINESS REQUIREMENTS TO BE MET BY THE SYSTEM	<p>To advance from the current traditional system setup to a hybrid IT setup that shall enable virtualization/containerization to run a private cloud, with end to end visibility into infrastructure performance metrics</p> <p>In addition to virtualization, is the container also needed?</p>	<p>Yes.</p> <p>Containerization is also required and Bidders are to provide this as necessary within their design/proposal.</p>
193	1.1.5 Data Center Connectivity	<p>“Each data center shall be composed of five (5) zones” What is the equipment requirement (quantity/capacity/performance) for each zone.</p>	There is no hard number for the components in the zones as they are not necessary physical equipment, they may be virtual instances and Bidders are free to base their design/proposal on best practice whilst ensuring a fully compliant solution is offered.

SI	Ref	Question	Answer
194	1.3 IMPLEMENTATION SERVICES	"Migration of virtual to virtual systems" What is the existing virtualization platform?	A mixture of application servers.
195	1.3 IMPLEMENTATION SERVICES	"Provide configuration to migrate existing systems data in the existing datacenters to the new storage systems" What is the existing storage? What is the capacity of the	At a minimum existing systems network need to be migrated to the new environment. Contractor will work with ECG and its partners to move existing systems that can be virtualized. Bidder is only expected to provide hosting resources and P2V migration when the application servers will permit.
196	1.3 IMPLEMENTATION SERVICES	"Achieve Active-Standby Continuous Replication" What is the scenario of the storage replication, normally the replication of storage is used by cloud platform automatically while the storage is using for the cloud platform.	Again there is presently no cloud platform at ECG. If possible SDS will be preferred over monolithic architecture such as SAN. The continuous replication is not applicable to SDS as this is implied.
197	2.1.3 Data Center Interconnect (DCI)	"All subnets will be configured as VLAN" Is that OK if configure the vxLAN for the business VM?	Bidders are to submit a fully compliant solution as specified within the IFB.  Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliancy with the IFB requirements.  .
198	System Inventory Table 5.1.12	"SDS ready Modular Disk Arrays" Does "Modular Disk Array" mean that an X86 server? Does this disk arrays be used as the storage of the cloud platform?	Bidders are to submit a fully compliant solution as specified within the Bidding Document.  Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the requirements.

SI	Ref	Question	Answer
199	<p>Section IV. Table of bidding forms – 4.4 form Page 116</p> <p>ECG Existing network - Attachment 3: Available Training Facilities Page 498</p>	<p>In the table B of page 116, for training location, we will provide training location if it occurs outside the country in proposal. However for the local training in the country we recommend customer provide the place where the trainees are familiar with because it can help improve the efficiency for all trainees. We can arrange instructors onsite to provide training.</p> <p>For the information mentioned in page 498, customer can provide existing local training place at Community 10, Tema, Ghana.</p> <p>So please confirm can customer provide local training location in Ghana and supplier provide outside country training location if this occurs in the project?</p>	Yes.
200	<p>Section IV. Table of bidding forms – 4.4 form Page 116</p>	<p>Also for the table B training part, how many people customer want to join in for in country training and outside country training. We recommend 12 people per class to ensure the quality of training.</p>	Kindly see Amendments 4-Training.
201	<p>Section IV. Table of bidding forms – 4.4 form Page 116</p>	<p>For the table C, what is main difference between warranty, technical support and maintenance? And How many years for each of them customer required?</p>	<p>Warranty guarantees the functionality of the product/system as specified by Supplier.</p> <p>Technical Support is the support to be provided for the operation or enhancement of the system, such as configuration changes.</p> <p>Maintenance includes all upgrades necessary to keep the system running as intended. For example hardware or software upgrade.</p>
202	<p>Table of Contents: Purchaser's Requirements – 0.2 business objective of the purchaser - Page 376</p>	<p>For the FAT (Factory Acceptance Test) mentioned in the scope, how long and how many people customer want enter for manufactory factory test. We recommend 2 people for 1 to 2 weeks.</p>	<p>The duration of the individual FAT's will be determined after review of the associated design documents and FAT procedure documents.</p> <p>The provisions for FAT and Quality Assurance / Site Testing issues are provided in Section VII – Purchaser's requirements of the Bidding Document. Bidder to read</p>

SI	Ref	Question	Answer
			<p>carefully and comply with requirements, in particular 3.4.8 and Attachment 4.</p> <p>All costs for such attendance shall be the responsibility of the Supplier.</p>
203	<p>Section VII - B. Business Function and Performance Requirements - 1.1.1  POWER – 1.1.1.1  <i>PROJECT OFFICE – PRIMARY DATA CENTER</i></p>	<ol style="list-style-type: none"> <li>1) What is the existed 60kVA power system distribution diagram, how to deal with the existed UPS of 60kVA? Replace or remove.</li> <li>2) For project office data center, it's required to newly add 9 racks. How about the new racks power density?</li> <li>3) For the utility power, how about the transformer? Is it ready or not, should Huawei provide it or not?</li> <li>4) For the Genset in project office, how about the brand and capacity? <b>Caterpillar 80KVA</b></li> <li>5) For the description "Genset" in Page 376, "<i>Shall a double skin tank become necessary for the 10 hours requirement, the double skin tank shall be built into the base-frame</i>". What does "Built into the base-frame" mean? It means a concrete support or the tanks shall be buried underground? <b>Into the base frame</b></li> <li>6) Whether the Genset should be with an outdoor shield since there is no specification about the shield? <b>Outdoor</b></li> </ol>	<ol style="list-style-type: none"> <li>1) Replace.</li> <li>2) 10 KW per racks.</li> <li>3) ECG has its own transformers.</li> <li>4) At the proposal of the Bidder.</li> <li>5) It means part of the frame, not separate.</li> <li>6) Outdoor.</li> </ol>
204	<p>Section VII - B. Business Function and Performance Requirements - 1.1.1  POWER – 1.1.1.2 <i>LEGON – SECONDARY DATA CENTER</i></p>	<ol style="list-style-type: none"> <li>1) What is the existed 5kVA power system distribution diagram, how to deal with the existed UPS of 5kVA? Replace or remove.</li> <li>2) In LEGON DC, how many racks existed?</li> <li>3) How about the power density required for the new racks?</li> <li>4) For the description "Genset" in Page 377, "<i>Shall</i></li> </ol>	<ol style="list-style-type: none"> <li>1) Replace.</li> <li>2) 4.</li> <li>3) 10 KW.</li> <li>4) It means part of the frame, not separate.</li> <li>5) Outdoor.</li> </ol>



SI	Ref	Question	Answer
		<p><i>a double skin tank become necessary for the 10 hours requirement, the double skin tank shall be built into the base-frame</i>". What does "Built into the base-frame" mean? It means a concrete support or the tanks shall be buried underground?</p> <p>5) Whether the Genset should be with an outdoor shield since there is no specification about the shield?</p>	
205	<p>Section VII - B. Business Function and Performance Requirements - 1.1.1  POWER – 1.1.1.3 KUMASI - DATA RECOVERY Room Power</p>	<p>1) As the description the Kumasi site can be considered as a green field. Whether should Huawei construct the rooms for the data center?</p> <p>2) How about the power density required for the new racks?</p> <p>3) For the description "Genset" in Page 379, "<i>Shall a double skin tank become necessary for the 10 hours requirement, the double skin tank shall be built into the base-frame</i>". What does "Built into the base-frame" mean? It means a concrete support or the tanks shall be buried underground?</p> <p>4) Whether the Genset should be with an outdoor shield since there is no specification about the shield?</p>	<p>1) Room exist.  2) 10 KW.  3) Part of the frame.  4) Outdoor shield.</p>
206	<p>Section VII - B. Business Function and Performance Requirements - 1.1.1  Power – 1.1.1.3 KUMASI - DATA RECOVERY Room Power - UPS: All DC and DR</p>	<p>There is a description: "<i>The UPS to the supply switchboard will be collocated in the same room</i>".</p> <p>What does "<i>power supply switchboard</i>" mean, is it AVR power distribution board or generator power distribution board, or both of them? Since the data center room is small, for these boards, can we place it outside the building and nearby the transformer/generator?</p>	<p>If after detailed design it is determined that there is insufficient space then, yes, this may be located outside assuming it is properly protected against all environmental and electrical/mechanical risks.</p>

SI	Ref	Question	Answer
207	Section VII - B. Business Function and Performance Requirements - 1.1.1 Power – 1.1.1.3 KUMASI - DATA RECOVERY Room Power - AVR: All DC and DR	<p>There is a description: “<i>The Supplier will be responsible for cabling between the AVR and the power generators</i>”.</p> <p>Please confirm the connection of AVR. Usually the AVR will be put between utility power and UPS, to stable the utility power. It’s seems not necessary to put AVR between GENSET and UPS.</p>	<p>That will depends on the generator you will propose and Bidders are to design/propose a system complying with best practice that is also fully compliant with the requirements of the Bidding Document.</p>
208	Section VII - B. Business Function and Performance Requirements - 1.1.2 HVAC – 1.1.2.4 BMS: All DC	<p>1) Which cameras are required to be monitored by BMS, existed cameras or the cameras should be newly install inside the server/power room? There is no specification about the CCTV system for DC facility in the tender book. In BMS chapter, it’s required to monitor the cameras. Please confirm the scope.</p> <p>2) For each data center, how many doors need access control lock? There is no specification about the access control system in the tender book. In BMS chapter, it’s required to monitor/control the doors. Please confirm the scope.</p> <p>3) There is no specification about Fire System in the tender book. In BMS chapter, it’s required to monitor the fire alarm. Please confirm the scope.</p> <p>4) What kind of devices should be monitored by BMS, only the devices Huawei newly provided or something already been on site? If existing, please provide the devices list that have the capability can be monitored (Controlled Devices Description, Controlled Devices Quantity, Control Point Type).</p>	<p>(1) New cameras shall be provided, specification for which shall ensure they are fit for purpose and provide at least the same functionality as the existing cameras. Final manufacturer/model shall be approved during detailed design stage.</p> <p>(2) Each DC has 2 or 1 Access door.</p> <p>(3) BMS is expected monitor fire detection system which may have to be replaced upon assessment of it interoperability with the BMS.</p> <p>(4) We are not aware of any newly installed Huawei devices. This may be a good information for your proposal.</p>

SI	Ref	Question	Answer
209	Section VII - B. Business Function and Performance Requirements - 1.1.2 HVAC – 1.1.2.4 DCIM: All DC	<ol style="list-style-type: none"> <li>1) What does “<i>LDAP support for Authentication and Authorization</i>” using for? Please clarify the function scenarios.</li> <li>2) What does “<i>Power Connections Documentation</i>” using for? Please clarify the function scenarios.</li> <li>3) What does “<i>Network Connections Documentation</i>” using for? Please clarify the function scenarios.</li> <li>4) What does “<i>Auditing</i>” using for? Please clarify the function scenarios.</li> </ol>	<ol style="list-style-type: none"> <li>1) LDAP support for authentication.</li> <li>2) By power connection documentation we mean power connection map.</li> <li>3) Network port mapping.</li> <li>4) Auditing for past configurations and events.</li> </ol>
210	Section VII - B. Business Function and Performance Requirements - 1.1.3 Data Center Layout	<ol style="list-style-type: none"> <li>1) How about the floor live load for each data center? Need the live load for both battery room and server room.</li> <li>2) How about the floor level of each data center?</li> <li>3) For “Fig 1.1.3.1: Project Office DC Layout”, the server room seems too small to hold 18 racks and 2 more room type HVAC at the same time. Is it the real size and how about the room size (net width, net height, net depth)? Are there any other equipment/racks occupation?</li> <li>4) For “Fig 1.1.3.2: LEGON DC Layout”, the server room seems too small to hold 9 racks and 2 more room type HVAC at the same time. Is it the real size and how about the room size (net width, net height, net depth)? Are there any other equipment/racks occupation?</li> <li>5) In “Fig 1.1.3.3: Kumasi DR Layout”, the server room hold 10 racks. Meanwhile in “1.1.1.3 KUMASI - DATA RECOVERY Room Power”, it requires the capacity to host 3 racks</li> </ol>	<ol style="list-style-type: none"> <li>1) Kindly refer to Answers to Questions 59 &amp; 60 above.</li> <li>2-4) Yes it is the actual real size, room sizes are provided in the IFB</li> <li>3) Bidders shall base their design/proposal on the room dimensions provided.</li> <li>4) That is the real size</li> <li>5) The Kumasi DC room is empty, the drawing in Fig 1.1.3.3 only showing the rack space, not existing racks</li> <li>6) See figures in section 1.1.3, height are between 8.5 and 9 feet</li> <li>7) The raised floor is already build in the project office is hosting racks on one side of it, therefore the remaining side with the same characteristics can withstand the new racks. If any additional raised build will be needed, we rely on the bidder to propose a raised floor with the proper characteristics to withstand the equipment to be placed</li> <li>8) Only the project office has raised floor which is already built.</li> <li>9) Project Office is raised floor, other DC’s cabling will be on trays/rails</li> <li>10) site visits were organized for this</li> <li>11) See answers above</li> </ol>

SI	Ref	Question	Answer
		<p>at a minimum. Please confirm the racks quantity.</p> <p>6) For “Fig 1.1.3.3: Kumasi DR Layout”, how about the room size (net width, net height, net depth)?</p> <p>7) There is no specification about the raised floor, lighting, socket, fire alarm, decorations such as painting, ceiling, floor leveling, grounding system etc. Please confirm the scope for each data center.</p> <p>8) For project office DC, LEGON DC and Kumasi DR, whether these three sites room are with raised floor? If yes, how about the raised floor net height?</p> <p>9) For the power cabling, it’s optional to lay the cable from top or from bottom (if from bottom, the room must be equipped with raised floor). Which one is preferred?</p> <p>10) For “Fig 1.1.3.1: Project Office DC Layout”, please confirm the existed 9 racks width, height, depth, and take photos for the rack roof.</p> <p>11) For “Fig 1.1.3.2: LEGON DC Layout”, please confirm the existed racks width, height, depth, and take photos for the rack roof.</p>	
211	<p>Section VI. B. SUBJECT MATTER OF CONTRACT</p> <p>7. Scope of the System (GCC Clause 7)</p> <p>Page318</p>	<p>The Supplier’s obligations under the Contract will include the following recurrent cost items, as identified in the Recurrent Price tables in the Supplier’s Bid:</p> <ul style="list-style-type: none"> <li>Services beyond the scope of warranty services to be incurred during the warranty period.</li> </ul> <p>What are the services beyond the scope of warranty?</p>	<p>Services beyond the scope of warranty are defined in ITB sub-clause 14.7 and are services outside the services to be incurred during the Warranty Period, defined in the PCC GCC Clause 29.10.</p> <p>They are services as necessary to ensure the continued and proper operation of the system in the warranty period but not covered by warranty services defined in ITB 14.7 and GCC 29.1 of the Bidding Document.</p>

SI	Ref	Question	Answer
212	Section VII. Purchaser's Requirements E. IMPLEMENTATION SCHEDULE Page464	IMPLEMENTATION SCHEDULE are all fixed, Can the date be changed according to the actual date of commencement?	The Implementation Schedule is the plan for implementing of the whole of the project and has not been revised and will only be revised in necessary and justified.
213	SECTION I. INSTRUCTIONS TO BIDDERS ("ITB") 6. Qualifications of the Bidder Page14.	(c)that, if a Bidder proposes Subcontractors for key services if and as <b>identified in the BDS</b> , these Subcontractors have agreed in writing to serve for the Bidder under the Contract(s) that may result from this bidding; and  Can we use a subcontractors' short list as a replacement of agreement? For now we cannot decide which subcontractor will be used.	No. We need to know the subcontractors that you will use. We cannot evaluate a subcontractor that may not be used and only merely a shortlist.
214	22.5.2 shipping and other documents	Suggest <b>cancel</b> all the docs requirement for the local purchase.  "For Goods supplied locally (i.e., from within the Purchaser's country):"	No. The requirement of sub-clause GCC 22.5.2 is obligatory.
215	GCC 22.5	Below 2 docs, we don't know what exactly?  1) Conformance certificate certified by recognized International Agency (for Goods outside of Purchaser's country) 2) Certificate from Purchaser's representative or authorized delegate to authorize delivery	These are standard certificates that shall be submitted prior to making any shipment.
216	29.10 warranty	Warranty start from PAC, must change to start from POD	GCC sub-clause 29.10 is clear on start of warranty period and this cannot be varied and remains same.

SI	Ref	Question	Answer
217	Responsibility Matrix: 5.2 Logistics	The trade term is CIP, so “Dispatch equipment from port to customer warehouse” should response by purchaser.	The term “CIP” has the meaning ascribed to it by “ <b>Incoterms 2010</b> ” edition and is the Final Destination or Site of the installation with product fully installed and functional.  This supersedes any other interpretation.
218	Overall program	Does the DC HBR need to be directly connected to the remote site?	Not sure what is meant by “directly”, but HBR is expected to have connectivity to the remote sites.
219	2.1.3 Data Center Interconnect (DCI)	“ECG will manage the deployment of the DCI link.” 1. Does it need to deploy new fiber link between DCs 2. If yes, whether bidder should cost for the deployment of fibers? 3. If yes, we need the distance between the DCs 4. If bidder is supposed to cost for the fibers, whether it will be new deployed or rent from carriers.	ECG will deploy the DCI link.
220	1.1.5 Data Center Connectivity	The CORE identifier in the topology, does it mean that the graph in the upper part is core or there is a core network below.	Kindly refer to Answer to Question No. 141 above.
221	2.1.14 Communication Network	HAR is not included in the topology of Data Center Connectivity (P388) . But it is mentioned in the Communication Network .which position will the HAR be deployed?	Kindly refer to Answer to Question No. 142 above.

SI	Ref	Question	Answer
222	2.1.2 Inter Zone Connectivity	There is no internal zone firewall in the Voice zone area according to the topology (p388), but a zone firewall is required according to the design requirements (Inter Zone Connectivity). Please confirm	Kindly refer to Answer to Question No. 144 above.
223	System Inventory Table (Supply and Installation Cost Items)	According to the topology of P388, each zone will have its own firewall, but there is only one pair of internal firewalls, a pair of external firewalls, and a pair of SCADA firewalls in the device list. Is there a mistake with the firewall quantity?	Kindly refer to Answer to Question No. 145 above.
224	Overall program	There are 6 aggregations and 20 access switches in the equipment list. It differs from the actual topology. Should the aggregation of voice and SCADA areas be access switches?	Kindly refer to Answer to Question No. 146 above.
225	Overall program	How about the requirement of AGG switches in the VOICE zone, is there a special type of interface needed?	Kindly refer to Answer to Question No. 147 above.
226	Overall program	Currently, the number of firewalls in the DC topology does not match the number of devices in the price SCH3. We recommend that each layer be deployed with two layers of firewalls separately. The core side does not deploy firewalls. -- Huawei's SDN solution is designed like this, Cisco is also the same	Kindly refer to Answer to Question No. 148 above.

SI	Ref	Question	Answer
227	2.1.10 Dev-Test	This type of logically isolated deployment is not recommended and may result in security risks due to anomalies.	Kindly refer to Answer to Question No. 150 above.
228	2.1.13 Disaster Recovery (DR) and Price SCH11	According to the topology design, the DR area shares a firewall between the WAN and the Internet. It is recommended to add firewalls for isolation. The number of devices in this part is inconsistent with the topology.	Kindly refer to Answer to Question No. 151 above.
229	2.1.13 Disaster Recovery (DR) and Price SCH11	According to the topology design, the DR area shares a firewall between the WAN and the Internet. It is recommended to add firewalls for isolation. The number of devices in this part is inconsistent with the topology.	Kindly refer to Answers to Questions No. 151 & 228 above.
230	ECG EXISTING NETWORK	The access switch at the remote site is 8 ports, the total number is 111, but the specifications are not seen in the bidding documents.	The final specifications will be determined and agreed during detailed design stage, but options may include the following;  8 ports 100M PoE access switch supporting at minimum: <ul style="list-style-type: none"> <li>▪ IEEE 802.1q - VLAN encapsulation</li> <li>▪ IEEE 802.3ad - Link Aggregation Control Protocol (LACP)</li> <li>▪ IEEE 802.1ab - Link Layer Discovery Protocol (LLDP)</li> <li>▪ Should support IEEE 802.3x Flow Control</li> </ul>
231	2.1.3 Data Center Interconnect (DCI)	According to the network topology, it is expected to deploy DCI interconnection between the cores of the two DCs. However, Layer 2 interconnection and virtual machine migration cannot be implemented in this solution.	This is inaccurate.



SI	Ref	Question	Answer
232	GCC12.1.a) GCC13.2.2 Page322/Page320	<p>GCC12.1.a) With reference to PCC 13.2.2 below, the amount of the Advance Payment shall be recovered from interim invoices submitted by the Supplier at the rate of one-fifth (1/5) of the value of each interim invoice withheld for Advance recovery.</p> <p>GCC13.2.2 The advance payment shall be repaid by the time 80% of the Contract Amount (excluding recurrent cost) have been made to the Supplier by deducting proportionate (pro-rata) amounts from invoices/payments due to the Supplier in accordance with PCC 12.1.</p> <p>Question : According to GCC 12.1.a), advance payment will be recovered at the rate of one-fifth, yet GCC13.2.2 states that advance payment shall be repaid by the time 80% of contract amount, please clarify on this process. Is it related to release of advance payment security as well?</p>	<p>Pursuant to GCC 12.1 (a), each interim certificate will be deducted for 20% of its value to recover Advance Payment.</p> <p>In accordance with GCC 13.2.2, all the Advance Payment loan shall be recovered by the time 80% of the Contract Amount has been paid to the Supplier.</p> <p>Once Advance Payment has been recovered fully, Advance Payment guarantee may be released to the Supplier.</p>
233	ITB 19.2 Page 48	<p>The notary public is enough to notarize the written authorization, no need to be authenticated by Ghana Consul responsible for the Supplier's Country. If still needs, please guide how and where to do the notary.</p>	<p>BDS ITB 19.2 on Power Attorney is clear and must be respected. The arena of action is in the Supplier's Country and the Bidder is advised to consult their legal counsel.</p>
234	2.1.12 Storage and Backup	<p>"The storage components whether SAN or distributed object store (SDS) will be interconnected across the two DC's via a dedicated DCI link."</p> <p>Is this "SDS" the same as the one in "2.2.2.1 SDS Management software"?</p>	<p>Yes.</p>

SI	Ref	Question	Answer
235	2.2.2.1 SDS Management software	Does this “SDS Management software” means the Distributed storage software which run on the X86 server?	SDS is an architecture framework where SDS management software manages the devices used to run SDS.
236	2.2.2.2 Modular Storage Array	Does this “Modular Storage Array” means X86 server which to deploy the Distributed storage software?	Bidders are to submit a fully compliant solution as specified within the requirements.  Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the requirements of the Bidding Document.
237	2.1.12 Storage and Backup	Do all of the zones use the same storage? Is the backup storage the same as the production storage?	Yes. The intent is for all zones to utilize the same storage,  Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the requirements. .
238	2.1.13 Disaster Recovery (DR)	What is the requirement about the DR? Do the application have the ability of the Disaster Recovery?	In a DR event, applications are supposed to be brought up manually.
239		Please would you be able to share the following two documents with us to form part of our tender, <ol style="list-style-type: none"> <li>1. Price Schedule Forms – DCCN (PA181018) Final</li> <li>2. Attendance register for site visit which had been completed during December 2018</li> </ol>	<ol style="list-style-type: none"> <li>1. Kindly refer to Answer to Question No. 1 above.</li> <li>2. Minutes of Pre-Proposal Meeting including Attendance register have been circulated to all prospective Bidders since 12<sup>th</sup> December, 2018; kindly retrieve your copy.</li> </ol>

SI	Ref	Question	Answer
240	Implementation Services Page 135 Chapter & section: 4.12	Kindly Confirm the locations covered in the project, where equipment will be installed and integrated besides the Project Office DC, Legon office DC and Kumasi DR site. Specifically, total number of remote sites to be integrated in the WAN, and number of voice subscribers in total and at each location.	See Amendments 1- District Sites list & 5-List sites.
241	Implementation Services Page 135 Chapter & section: 4.12	What is the existing number or projected number of DC engineers that will need to be trained to support the new infrastructure at all sites?	See Amendment 4- Training.
242	Data Center Host Servers Page 132 Chapter & section: 4.13	Besides Blades, are other Server form factors acceptable such as Hyper-Converged Infrastructures and other Dense form factors?	Bidders are to submit a fully compliant solution as specified in the Bidding Document.  Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the requirements.
243	Data Center Host Servers Page 132 Chapter & section: 4.13	Are the processor speed and core count requirements taking into account the possibility of optimising for Oracle and Microsoft licensing costs?	In the design, the bidder should optimize licensing cost based on the DB vendor.
244	Data Center Host Servers Page 132 Chapter & section: 4.13	The network interface requirement provided may not be sufficient considering that these same network interfaces are to be used for storage and network traffic as well as Vmotion and internal Vsphere traffic. Can we propose more network interfaces (at least 40Gb per CPU) in line with commonly accepted best practice? and if so how will the bid be assessed on equal footing?	Form DCCN-2 specifies a minimum requirement. Bidders shall design/propose a system that is sufficiently sized to ensure full compliance with the specified performance requirements.

SI	Ref	Question	Answer
245	Data Center Host Servers - Automation Admin and provisioning Page 134 Chapter & section: 4.13	How many VM templates are to be defined initially? can we assume 3 windows templates and 3 linux templates?	Simple and effective centralized managed is specified. The exact quantities for each item will be determined during detailed design stage.  Bidders are expected to present a proposal to be evaluated, and If Bidders are limited in their ability to provide any quantity then this should be stated in their Bid within the "No (remarks)" column.
246	Data Center Host Servers - Automation Admin and provisioning Page 134 Chapter & section: 4.13	How many VM provisioning and housekeeping processes are to be automated? and what are some of the event/scenarios to be automated?	Kindly see Answer to Question 245 immediately above.
247	Storage Page 137 Chapter & section: 4.14	Is HCI or VSAN architecture acceptable to meet the requirements of the customer in terms of storage?	Bidders are to submit a fully compliant solution as specified in the Bidding Document.  Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the requirements.
248	Storage Page 137 Chapter & section: 4.14	In the absence of detailed information about the legacy and future applications that will be hosted in the DC and their associated compute and storage requirement, can we consider providing All Flash Storage for the main production and mission critical applications and reserve NL-SAS drives clusters only for backup, Dev and Test environments?	Kindly see Answer to Question 247 immediately above.
249	Storage Page 137 Chapter & section: 4.14	There appears to be no mention of a requirement for a data backup and recovery solution, or a requirement to make and retain backups of the DC guest VMs. Can we propose VM based backup appliances as part of the storage solution? Can we propose a minimum backup coverage of 5GB of Active Data, a daily full backup schedule, deduplication, and a backup retention period of 180 days?	Bidders are to submit a fully compliant solution as specified in the Bidding Document.  Bidders are expected to present a proposal to be evaluated. Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the requirements.

SI	Ref	Question	Answer
			We expect backup data to be synchronized within 5mn.
250	Network & Communication Components ... Page 139 Chapter & section: 4.15 Items 1 & 3	Is a fully virtualized network solution acceptable? (Switching, Routing, Load balancers, High end and Midrange Firewalls et al.)	Bidders are to submit a fully compliant solution as specified in the Bidding Document.  Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the requirements.
251	Network & Communication Components ... Page 175-182 Chapter & section: 4.22 - 4.23	Kindly confirm that the scope of the assignment, with regard to Remote WAN routers and regional site access switches and VOIP terminals is simply to supply and configure. Will the customer take full responsibility for installing and commissioning the regional routers and access switches and VOIP terminals at all the remote offices?	All works necessary to provide a fully functioning system, including the installation and commissioning of these devices, shall be the responsibility of the Bidder. .
252	Network & Communication Components ... Page 485 Chapter & section: System Inventory Table (Supply and Installation Cost Items)	The table does not have quantities for Items like Storage, the VOIP terminals, Videoconferencing systems, etc. these are not provided anywhere else in the document either. Can the customer clarify?	See Amendment 3-Equipment Count.
253	UPS, Power Conditioning, HVAC and Diesel Generators Page 218-232 Chapter & section: 4.35 - 4.45	The expected power utilization is not provided for any of the 3 sites. Is it possible to provide a standard estimate for expected power utilization per rack that we can extend to estimate the facility power utilization for each of the 3 sites? Otherwise kindly provide minimum cooling capacity per site (before redundant capacity added on), minimum UPS capacity (before redundant capacity added on) and minimum AVR and Diesel Generator Capacity for all the three sites?	These issues shall be determined during detailed design stage.

SI	Ref	Question	Answer
254	Page 374: Terms Used in These Purchaser's Requirements Tier-3 Data center cooling resources.	<ul style="list-style-type: none"> <li>Is any Certification of Tier 3 is needed from Uptime Institute or others?</li> <li>If yes, for which sites is it required?</li> </ul>	<p>With regards Section III, C4.4.3, Bidders are to provide confirmation/certification that at least two (2) of their reference Data Centers were classified as Tier-3.</p> <p>With regards the Data Centre implementations provided as specified in the IFB, no Tier-3 certification is required although Bidders are free to propose such certification, at no cost to the Purchaser, if it is required for their own purposes.</p>
255	Page 375: Power	<ul style="list-style-type: none"> <li>Is there any Electrical Single Line Diagram of the existing and new requested offer?</li> </ul>	No.
256	Page 476: Racks and accessories	<ul style="list-style-type: none"> <li>QTY 9 or 3 as in Page 378</li> </ul>	At Kumasi, three (3) racks are specified within Section VII, C1.1.1.3 as a minimum. Bidders are free to design/propose further racks if needed within their design proposal.
257	Page 375: Project office DC has one Genset that must be coupled with a new Genset to be procured in the contract for redundancy.	<ul style="list-style-type: none"> <li>What is the Capacity and model of the existing Generator?</li> </ul>	60KVA, Caterpillar.
258	Down Time	<ul style="list-style-type: none"> <li>What is the Maximum accepted Down time in Main DC?</li> </ul>	Bidders shall refer to Section VII, C2.2.1 "Business Continuity & Security" where it is specified a downtime of zero (0) shall apply.
259	HVAC for Power and Control Rooms	<ul style="list-style-type: none"> <li>Is HVAC for Power and Control Rooms required, which type CRAC as DC or Split Units?</li> </ul>	Yes, the new HVAC equipment shall also accommodate the HVAC requirements associated with the Power and Control Rooms at all sites. Bidders are free to propose either DC or split units with justification whilst ensuring full compliance with the IFB is maintained.

SI	Ref	Question	Answer
260	CRAC Units location	<ul style="list-style-type: none"> <li>Are there any other spaces that can be used for CRAC units as the available DC room size is too tight?</li> </ul>	<p>If after detailed design it is determined that there is insufficient space then, yes, this may be located outside assuming it is properly protected against all environmental and electrical/mechanical risks.</p>
261	Page 384: Physical Access, Fire alarms, camera monitoring, heating and cooling.	<ul style="list-style-type: none"> <li><b>Will the bidder have any Supply scope</b> of Physical Access, Fire alarms, camera monitoring, and heating or it's only Integration with existing systems.</li> </ul>	<p>Bidders shall provide all systems specified within Section VII, C1.1.2.4 and integrate/commission them into the respective BMS systems.</p>
262	Servers	<ul style="list-style-type: none"> <li>Will all servers listed in the proposed BOQ be used in virtualization environment? If not, can we have numbers for those which are to be used as bare blade and those that will be used as VM hosts?</li> </ul>	<p>Yes.</p>
263	Database Engines	<ul style="list-style-type: none"> <li>Can we have a list for all Database engines in place and their versions?</li> </ul>	<p>See Amendments 6-10.</p>
264	Migration	<ul style="list-style-type: none"> <li>To propose the migration strategy, can we have a list for applications and services (with software and hardware configuration associated) that : <ul style="list-style-type: none"> <li>Will be migrated to virtual environment.</li> <li>Will be migrated As-IS to new physical environment</li> <li>Will be shifted as is to new location.</li> </ul> </li> </ul>	<p>This will be determined during detailed design stage.</p>

SI	Ref	Question	Answer
265	Backup	<ul style="list-style-type: none"> <li>• Can we have list for current backup environment ( backup software and Hardware, capacity, policies, schedules, retentions, connection topology)</li> <li>• Can we have a list for applications and services to be added to new proposed backup environment and required RPO/RTO?</li> </ul>	This will be determined during detailed design stage.
266	Replication	<ul style="list-style-type: none"> <li>• In terms of Replication; Can we have a list for applications/services capacities that required to be replicated and RPO/RTO required?</li> </ul>	This will be confirmed during detailed design stage. May be; RPO 5 minutes RTO 1 hour
267	Page 112: Confirmation of Responsibility for Integration and Interoperability of Information Technologies	<ul style="list-style-type: none"> <li>• What are the expectations in clearer terms? Will the bidder be responsible for the operations of all the components of the project (i.e. Is the entire project a Turn Key Solution?)</li> <li>• Who will take any necessary approvals needed from local authorities (In terms of any permit approvals or any government authorities where the bidder will need to seek licenses for providing link at new sites etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Bidder be responsible for the operations of all the components of the project</li> <li>• Bidder will take full lead responsibility for everything required to complete his tasks with assistance of the Purchaser.</li> </ul>
268	Civil Work	<ul style="list-style-type: none"> <li>• Are there any required CIVIL Works including Raised floor, False ceiling, doors, Lighting, etc. at any of the project Locations?</li> </ul>	Yes, all necessary civil works are to be provided by the Contractor as per the requirements.



SI	Ref	Question	Answer
269	Solution Options	<ul style="list-style-type: none"> <li>Is it acceptable to offer multiple options?</li> </ul>	<p>A Bidders are to submit a fully compliant solution as specified in the IFB.</p> <p>Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the IFB requirements.</p>
270	Site Visit	<ul style="list-style-type: none"> <li>Can we Re-Visit the Sites before the Submission date, and what is the required process?</li> </ul>	No.
271	ITB: 6.4 Page 45: Subcontracting Limitations	<ul style="list-style-type: none"> <li>What are the Key Services which limit subcontracting to 40% of services?</li> </ul>	<p>“Key Services” are not specified in the IFB.</p> <p>The limit of 40% of Services for subcontracting was not determined by Key Services. The 40% is based on the total volume of the assignment.</p>
272		<ul style="list-style-type: none"> <li>What would be the bandwidth between site A and SiteB and between them and DR?</li> </ul>	Bandwidth will be whatever is necessary to ensure a fully compliant solution is implemented.
273		<ul style="list-style-type: none"> <li>If this is a VXLAN BGPEVPN deployment as specified in the compliance document why do we have access, aggr and core. Most recommended VXLAN BGP-EVPN design leverages CLOS spine and leaf architecture. TOR Leaf/switches connecting to the spine (core) switches. This presentation simplifies the much comprehensive design guide. This design has a lot of advantages like predictability of traffic, more efficient, and scaling is a lot more simplified. Can we propose this instead or must we stick to the</li> </ul>	<p>Bidders are to submit a fully compliant solution as specified in the IFB.</p> <p>Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the IFB requirements.</p>

SI	Ref	Question	Answer
		3 tier design requirement?	
274		<ul style="list-style-type: none"> <li>- Please advise on the total number of ports and port type (copper, fiber), density (1 or 10G) for the existing 23 servers on page 490</li> </ul>	<p>You can assume that the 95 of the existing server ports are 1G copper.</p> <p>The actual information will be determined during detailed design stage of the project.</p>
275		<ul style="list-style-type: none"> <li>- What are the Jump server requirements for CPU, memory, and storage?</li> </ul>	<p>Bidders are to submit their design/proposal which will ensure full compliancy with the IFB.</p>
276		<ul style="list-style-type: none"> <li>- What is the total usable capacity of storage required?</li> </ul>	<p>Bidders are to provide storage capacity that ensures compliance with the IFB.</p>
277		<ul style="list-style-type: none"> <li>- What is the required number of IOPS? All flash (SSD) or Hybrid (HDD)?</li> </ul>	<p>If Traditional storage – SAN</p> <ul style="list-style-type: none"> <li>- The storage array must be fully redundant for all components</li> <li>- Supports various connectivity types, including: <ul style="list-style-type: none"> <li>o Fiber channel, with at least 16Gb/s speed</li> <li>o 10Gb/s Ethernet and 10Gb/s SFP</li> <li>o FCoE/iSCSI</li> </ul> </li> <li>- Supports at least 250 HDD of SSD, SAS, NL-SAS</li> <li>- Supports thin provision LUNs</li> <li>- At least 96GB RAM</li> <li>- Ability to use SSD drives as cache layer</li> <li>- At least 12Gb/s SAS ports for Back End Connection</li> </ul>

SI	Ref	Question	Answer
			<ul style="list-style-type: none"> <li>- Supports single LUN of maximum 256TB</li> <li>- Supports multiple snapshots per each LUN</li> <li>- Supports 2.5" and 3.5" hard drives</li> <li>- Supports RAID 1/5/6</li> <li>- Hot spare drives with automated failover</li> <li>- Supports replication in LUN level – sync and async</li> <li>- Supports LUN copy</li> <li>- Include performance monitor</li> <li>- Single point of management</li> <li>- Supports GUI and CLI</li> <li>- Supports ASHRAE Equipment Class A4</li> <li>- Supports mix of 3 tiers of disks (SAS, NL-SAS, SSD) in the same Logical Unit, with automatic data relocation between tiers</li> <li>- 300TB net capacity – native (before de-dup and compression)</li> <li>- At least 35,000 IOPS of 8K block size, with 60%-40% R/W ratio, on 25% of the net capacity</li> <li>- The ability to grow by at least 200% while using the same controllers</li> <li>- The ability to grow by at least 200% while maintaining the IOPS performance of the newly added capacity, i.e. 25% of the newly added net capacity</li> <li>- 3 years support for software and hardware</li> <li>- 4 hours software support</li> <li>- Next-day hardware support</li> </ul> <p>If SDDC – Software Defined Data Center</p> <ul style="list-style-type: none"> <li>- The vendor must be a mature internationally recognized company, which has been in existence for more than 5 years and the specified model is not reaching end of support/life in the next 5 years.</li> <li>- Installed on bare metal</li> <li>- Supports VMWare/HyperV</li> <li>- Ability to lose at least one node</li> <li>- Supports at least 30 nodes</li> <li>- Supports thin provision LUNs</li> <li>- At least 512GB RAM</li> <li>- At least 10Gb/s Back End Connection</li> </ul>

SI	Ref	Question	Answer
			<ul style="list-style-type: none"> <li>- Supports single LUN of maximum 60TB</li> <li>- Supports multiple snapshots per each LUN</li> <li>- Supports CIFS and NFS shares</li> <li>- Supports iSCSI LUNs export</li> <li>- Supports replication in LUN level</li> <li>- Supports LUN copy</li> <li>- Supports online migration – sync and async</li> <li>- Include performance monitor</li> <li>- Single point of management</li> <li>- Supports GUI and CLI</li> <li>- 300TB capacity</li> <li>- At least 35,000 IOPS of 8K block size, with 60%-40% R/W ratio</li> <li>- The ability to grow by at least 200% with no dependency of existing nodes models</li> <li>- Each additional node must provide at least the same performance of existing nodes, in terms of CPU, RAM, capacity and network</li> <li>- 3 years support for software and hardware</li> <li>- 4 hours software support</li> <li>- Next-day hardware support</li> </ul>
278		<ul style="list-style-type: none"> <li>- Kindly confirm whether or not the RADIUS/TACACS servers stated within pages 473 – 478 are required for any other purpose other than basic AAA &amp; device administration.</li> </ul>	Correct. They are.
279		<ul style="list-style-type: none"> <li>- Do we have a list of locations / offices with the number of employees per location?</li> </ul>	The actual information will be determined during detailed design stage of the project.
280		<ul style="list-style-type: none"> <li>- What's the exact design for the "central communications manager" (4.6) and the "remote communication manager" (4.7)? Why can't we just use a single cluster with remote locations?</li> </ul>	We need site autonomy at remote sites.

SI	Ref	Question	Answer
281		<ul style="list-style-type: none"> <li>- What are the requirements for video conferencing (just internal 1-to-1 calls, external calls, scheduled conferences, etc.)? Where should the video endpoints be registered to (cloud or on-premise)?</li> </ul>	<p>Video conferencing shall be used for any purpose.</p> <p>No cloud service is being user for voice/video.</p>
282		<ul style="list-style-type: none"> <li>- Why does the wireless IP phone require a video camera (4.11)?</li> </ul>	<p>That is a typo, no camera required for wireless phones.</p>
283		<ul style="list-style-type: none"> <li>- Why are the requirements for the low-end and mid-range IP phones identical?</li> </ul>	<p>Mid-range phone must have Graphical display LED and color camera.</p>
284		<ul style="list-style-type: none"> <li>- What functionality does the customer refer to when they say smart screen?</li> </ul>	<p>Smart screen allow among other things, synchronization of the screen touches and screen moves with the screen at the source (for example a PC).</p>
285		<ul style="list-style-type: none"> <li>- Will the customer be deploying all collaboration application for 5000 users? E.g. 5000 contact center, 5000 IP telephony</li> </ul>	<p>Bidder will be deploying the applications.</p>
286		<ul style="list-style-type: none"> <li>- Exact number of remote sites and required remote site POE switches.</li> </ul>	<p>There are 120 remote sites with 8 ports PoE and 9 regional sites with 1 or 2 48 ports PoE switches – see IFB.</p>

SI	Ref	Question	Answer
287		<ul style="list-style-type: none"> <li>- Windows:               <ul style="list-style-type: none"> <li>• Version of AD, number of users (CALs)</li> <li>• Version of Exchange, amount of Exchange servers, number of databases, size of mailboxes</li> </ul> </li> </ul> <p>Management systems</p>	<p>The actual information will be determined during detailed design stage of the project.</p>
288		<ul style="list-style-type: none"> <li>- What are the future systems that might be required for the new DC, such as ERP, development, BI, etc. <u>and the resources required</u>, for future planning</li> </ul>	<p>Known future systems are ERP, MMS, GIS and OMS.</p> <p>Capacities for all resources will be defined during detailed design stage.</p>
289		<ul style="list-style-type: none"> <li>- Databases (Page 43)P:               <ul style="list-style-type: none"> <li>o What kind of databases are currently exists?</li> <li>o Which exact version is each of the above databases?</li> <li>o What are the requirements for each database, in terms of CPU cores, RAM, IOPS?</li> <li>o Are there any databases running in a cluster? Which cluster? Active/active, or active/passive?</li> <li>o What type and version of operating systems is running on each database?</li> </ul> </li> </ul>	<p>Will be well defined during detailed design.</p>
290		<ul style="list-style-type: none"> <li>- Servers:               <ul style="list-style-type: none"> <li>o Is it mandatory to use Blade Chassis, or can the bidder offer to use single servers?</li> </ul> </li> </ul>	<p>Bidders are to submit a fully compliant solution as specified within the IFB.</p> <p>Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the IFB requirements.</p>

SI	Ref	Question	Answer																																																						
291		<ul style="list-style-type: none"> <li>- Page 44               <ul style="list-style-type: none"> <li>o For the ISO certificate, our company is part of a group. Can we use the ISO of the group?</li> <li>o Can the past experience of the sub-bidder, can be used to fulfill the experience requirements in the bid?</li> </ul> </li> </ul>	<p>The Qualification requirements for Bidder in partnership or association or jv is given in 4.0 Qualification of Section III Bid Review, Evaluation Criteria and Bidder Qualification Requirements.</p> <p>The requirements must be strictly met.</p>																																																						
292		<ul style="list-style-type: none"> <li>- Which applications are running on each of the existing servers, as per the provided table.</li> <li>does the bidder have to come up with a solution for second copy of one of these servers (i.e. an additional server in the 2<sup>nd</sup> site/DR site)?</li> </ul> <table border="1" data-bbox="541 727 1226 1515"> <thead> <tr> <th data-bbox="541 727 835 773">Make</th> <th data-bbox="835 727 1150 773">Model</th> <th data-bbox="1150 727 1226 773">Quan</th> </tr> </thead> <tbody> <tr><td>Dell</td><td>NX 3230</td><td></td></tr> <tr><td>Dell</td><td>PowerEdge 2950</td><td></td></tr> <tr><td>Dell</td><td>PowerEdge R320</td><td></td></tr> <tr><td>Dell</td><td>PowerEdge R630</td><td></td></tr> <tr><td>Dell</td><td>PowerEdge R710</td><td></td></tr> <tr><td>Dell</td><td>PowerEdge R720</td><td></td></tr> <tr><td>Dell</td><td>PowerEdge R730</td><td></td></tr> <tr><td>Dell</td><td>PowerEdge R930</td><td></td></tr> <tr><td>Dell</td><td>SC 4020</td><td></td></tr> <tr><td>HP</td><td>P 2000</td><td></td></tr> <tr><td>HP</td><td>Proliant DL 360p Gen 8</td><td></td></tr> <tr><td>HP</td><td>Proliant DL 380 95</td><td></td></tr> <tr><td>HP</td><td>Proliant DL380 GEN9</td><td></td></tr> <tr><td>HUAWEI</td><td>RH2288HV3</td><td></td></tr> <tr><td>IBM</td><td>Power 710</td><td></td></tr> <tr><td>IBM</td><td>Power 720</td><td></td></tr> <tr><td>IBM</td><td>System x3650 M4</td><td></td></tr> </tbody> </table>	Make	Model	Quan	Dell	NX 3230		Dell	PowerEdge 2950		Dell	PowerEdge R320		Dell	PowerEdge R630		Dell	PowerEdge R710		Dell	PowerEdge R720		Dell	PowerEdge R730		Dell	PowerEdge R930		Dell	SC 4020		HP	P 2000		HP	Proliant DL 360p Gen 8		HP	Proliant DL 380 95		HP	Proliant DL380 GEN9		HUAWEI	RH2288HV3		IBM	Power 710		IBM	Power 720		IBM	System x3650 M4		<p>Bidder solution must account for hosting these servers.</p>
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		<table border="1"> <tr> <td>IBM</td> <td>System x3850 x5</td> <td>2</td> </tr> <tr> <td>Lenovo</td> <td>HX Series</td> <td>3</td> </tr> <tr> <td>Lenovo</td> <td>System x 3650 MS</td> <td>2</td> </tr> <tr> <td>Lenovo</td> <td>System x3850 x6</td> <td>2</td> </tr> <tr> <td>Citrix NetScaler</td> <td>PROMPPPLBO1</td> <td>2</td> </tr> <tr> <td>Synology cloud Service</td> <td></td> <td>2</td> </tr> <tr> <td colspan="2"><b>TOTAL SERVERS</b></td> <td><b>23</b></td> </tr> <tr> <td>APC</td> <td>UPS 5000</td> <td>6</td> </tr> <tr> <td>HP</td> <td>UPS R 7000</td> <td>1</td> </tr> </table>	IBM	System x3850 x5	2	Lenovo	HX Series	3	Lenovo	System x 3650 MS	2	Lenovo	System x3850 x6	2	Citrix NetScaler	PROMPPPLBO1	2	Synology cloud Service		2	<b>TOTAL SERVERS</b>		<b>23</b>	APC	UPS 5000	6	HP	UPS R 7000	1	
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293		<ul style="list-style-type: none"> <li>- Training <ul style="list-style-type: none"> <li>o What is the number of attendees, for each area of training?</li> </ul> </li> </ul>	See Amendments 4.																											
294	Submission Deadline Extension	<ul style="list-style-type: none"> <li>• Is it possible that the submission deadline will be extended? And if so, when will the bidders be notified?</li> </ul>	No.																											
295		<p>Per the design there are two DC Core fabric switch and two DC Aggregate fabric switch. But in the Excel sheet you have shared its written QTY 0 for DC Aggregate Switch</p> <table border="1"> <tr> <td>.11.</td> <td>DC Core Switch</td> <td></td> <td>No</td> <td>2</td> </tr> <tr> <td>.11.</td> <td>DC Aggregate Switches</td> <td></td> <td>No</td> <td>0</td> </tr> </table>	.11.	DC Core Switch		No	2	.11.	DC Aggregate Switches		No	0	Bidder to correct any inconsistency as appropriate.																	
.11.	DC Core Switch		No	2																										
.11.	DC Aggregate Switches		No	0																										



SI	Ref	Question					Answer
		1.11.8	DC Access switches		No	4	
296	Section VII - B. Business Function and Performance Requirements	<p>Please mark the scope for below items:</p> <p>Project management</p> <p>7) Project management <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>8) Health, Safety, Environmental and Quality (HSEQ) requirements <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>Utility and Permission</p> <p>1) Application, Provision and connection of grid power, sewage, water and telecom services with public utilities/authorities during project execution period and related cost. <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>2) All needed access for project execution, like construction permits, access permits <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>3) All needed permits for building provision, street closures/ diversions/ unloading, if applicable. <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>4) All needed approvals from authorities and municipality <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>Site Preparation</p> <p>1) Provision of the qualified utility power and transformer nearby the Data Center. <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>2) The HV/MV power panel, transformer panel preparation <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>3) Water supply and drainage facility</p>					<p>Bidder will be responsible for all components/items of the system(s) except:</p> <ul style="list-style-type: none"> <li>• ECG will provide utility power, water and any network connections services from service providers.</li> </ul>

SI	Ref	Question	Answer
		<p><input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>4) Provision of the location near by the Data Center to install generator, oil tank, etc. <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>5) Generator for Data Center <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>6) Supply and install of Oil Tank <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>7) Pipe connection of Generator <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>8) Broadband Access provision <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>9) Lightning system <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>Civil and Decoration</p> <p>1) Decorations, such as painting, ceiling, partition, grounding leveling <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>2) Anti-static Raise floor and ramps <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>3) Lighting and socket <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>4) Grounding system <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>5) Cable Tray <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>6) Water source for Air conditioners <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>7) Light for construction period <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>8) Fire-monitoring and alarm system <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>9) Fire-fighting system <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p>	

SI	Ref	Question	Answer
		<p>DC Preparation</p> <ol style="list-style-type: none"> <li>1) Site Survey and HLD    <input type="checkbox"/>Huawei   <input type="checkbox"/>Customer</li> <li>2) LLD Designing    <input type="checkbox"/>Huawei   <input type="checkbox"/>Customer</li> <li>3) Review and confirm Designing       <input type="checkbox"/>Huawei   <input type="checkbox"/>Customer</li> <li>4) Preparing the office area and environment       <input type="checkbox"/>Huawei   <input type="checkbox"/>Customer</li> <li>5) Preparing construction tools    <input type="checkbox"/>Huawei       <input type="checkbox"/>Customer</li> </ol> <p>Logistics</p> <ol style="list-style-type: none"> <li>1) Trade Term: CIP    <input type="checkbox"/>Huawei   <input type="checkbox"/>Customer</li> <li>2) Sea shipment to Tema Port    <input type="checkbox"/>Huawei       <input type="checkbox"/>Customer</li> <li>3) Dispatch equipment from port to customer       warehouse       <input type="checkbox"/>Huawei   <input type="checkbox"/>Customer</li> <li>4) Custom clearance and warehouse management       <input type="checkbox"/>Huawei   <input type="checkbox"/>Customer</li> <li>5) Bring Equipment from warehouse to       construction area.       <input type="checkbox"/>Huawei   <input type="checkbox"/>Customer</li> </ol> <p>DC Facility Implementation</p> <ol style="list-style-type: none"> <li>1) Technical Supervision of site installation       <input type="checkbox"/>Huawei   <input type="checkbox"/>Customer</li> <li>2) HVAC installation    <input type="checkbox"/>Huawei   <input type="checkbox"/>Customer</li> <li>3) Water supply and drain pipes connection to air       conditioners       <input type="checkbox"/>Huawei   <input type="checkbox"/>Customer</li> </ol>	

SI	Ref	Question	Answer
		<p>4) UPSs and batteries installation and cabling  <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>5) Cabling from utility transformer panel to AVR.  <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>6) Cabling from AVR to data center  <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>7) Cabling from Genset to data center  <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>8) Racks installation <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>9) Monitoring system and it's cabling  <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>10) CCTV system <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>11) Site clean <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>Commissioning and Integration</p> <p>1) AC commissioning <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>2) UPS commissioning <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>3) PDF commissioning <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>4) Monitor system commissioning  <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>5) Transformer commissioning  <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>6) Generator for containers commissioning  <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>7) Whole DC system commissioning  <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p> <p>8) Commissioning planning  <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</p>	

SI	Ref	Question	Answer
		<p>Inspection and acceptance</p> <ol style="list-style-type: none"> <li>1) Prepare the acceptance document <ul style="list-style-type: none"> <li><input type="checkbox"/>Huawei <input type="checkbox"/>Customer</li> </ul> </li> <li>2) Preparing Inspection and acceptance tools <ul style="list-style-type: none"> <li><input type="checkbox"/>Huawei <input type="checkbox"/>Customer</li> </ul> </li> <li>3) Perform site inspection according to PAT/FAT checklist <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</li> <li>4) Establishment the acceptance plan and Perform acceptance test <input type="checkbox"/>Huawei <input type="checkbox"/>Customer</li> <li>5) Issue PAC/FAC certificate <ul style="list-style-type: none"> <li><input type="checkbox"/>Huawei <input type="checkbox"/>Customer</li> </ul> </li> <li>6) Training as per the contract requirement <ul style="list-style-type: none"> <li><input type="checkbox"/>Huawei <input type="checkbox"/>Customer</li> </ul> </li> </ol>	
297	GCC13.3.3 P247	<p>13.3 Performance Security</p> <p>13.3.1 The Supplier shall, within twenty-eight (28) days of the notification of Contract award, provide a security for the due performance of the Contract in the amount and currency specified in the PCC.</p> <p>13.3.2 The security shall be a bank guarantee in the form provided in the Bidding Forms Section of the Bidding Documents, or it shall be in another form acceptable to the Purchaser.</p> <p>13.3.3 The security shall automatically become null and void once all the obligations of the Supplier under the Contract have been fulfilled, including, but not limited to, any obligations during the Warranty Period and any extensions to the period. The security shall be returned to the Supplier no later than twenty-eight (28) days after its expiration.</p> <p>13.3.4 Upon Operational Acceptance of the entire System, the security shall be reduced to the</p>	<p>The Performance Security is 10% of the Contract Amount less recurrent costs and remains so up to Operational Acceptance.</p> <p>After Operational Acceptance through warranty period to post-warranty the Performance Security is reduced to and remains at five per cent (5%) percent of the Contract Amount less recurrent costs.</p> <p>The Performance Security is released to the Supplier only after the post-warranty period.</p>

SI	Ref	Question	Answer
		<p>amount specified in the PCC, on the date of such Operational Acceptance, so that the reduced security would only cover the remaining warranty obligations of the Supplier.</p> <p>GCC 13.3.1 : The Performance Security shall be denominated in US Dollars for an amount of ten per cent (10%) of the Contract Price excluding any Recurrent Costs.</p> <p>GCC 13.3.4 :</p> <p>During the Warranty Period (i.e., after Operational Acceptance of the System), the Performance Security shall be reduced to five per cent (5%) percent of the Contract Price, excluding any Recurrent Costs.</p> <p>Question : Does the performance security become null only after Warranty period (36 months) and post warranty period (additional 24 months)?</p>	
298	GCC Clause41.1	Will customer compensate the loss or damage suffered by supplier which is arising from such kind of termination by customer according to this clause "Termination for Purchaser's Convenience"	<p>Kindly read GCC sub-clause 41.1.3 for the remedies accruing the Supplier in the event of termination pursuant to GCC sub-clause 41.1.1.</p> <p>No other remedy are applicable.</p>
299	PCC clause 14, GCC clause 14	When can supplier get the exemption certificate of taxes within Ghana territory from customer?	Bidders are exempted from taxes and import duties, and exemption letters would be issued to the successful Bidder upon engagement.

SI	Ref	Question	Answer
b	GCC clause 42.1	Is it ok for supplier to assign the credit or recovery owed by Customer from this project to third party without the consent of Customer according to this clause?	No. Pursuant to GCC sub-clause 42.1 neither party shall assign the whole or any part of the Contract, or any benefit or interest in or under the Contract, without the consent of the other party.
301	2.2 DETAILED TECHNICAL SPECIFICATIONS: "The management solution should provide server backup and restore capabilities ",	What data is to be backed (and restored), the configuration of the server or the data of the guest OS running on the server?	Both.
302	General IT questions	Do you want to manage the three data center in a unified management platform?	Yes.

SI	Ref	Question	Answer
303	General IT questions	Is the vendor required to provide the disaster recovery capabilities for VM?	In a DR, VM's are expected to be brought up manually.
304	General IT questions	What is the service relationship between the three data centers? For example, an application cluster is deployed across sites, or a separate application is deployed at different sites and then disaster-tolerant to other sites through the capabilities of the application.	Application cluster will be between the 2 DC's and the Backup of application data and configuration will be at the DR, ready to be brought up on Host servers at the DR. The customer will determine the list of applications that could be brought up at the DR.
305	General IT questions	About SDN, do you need the SDN controller to control the entire network provisioning including the network of virtual machine, or just the auto-configuration of the network device?	Entire network provisioning.



SI	Ref	Question	Answer
306	2.2.2.1 SDS Management software	What is the meaning of ABS, what is the function of Volume Groups, means mass allocation LUN used for the host?	Please kindly refer to Answers to Questions No. 86 & 128 above.
307	4.13 Form DCCN -2 Data Center Host Servers	What is the capacity of modular storage array and what's the business needed to support, what is the performance requirement of the business?	Please kindly refer to Answers to Questions No. 87 & 129 above.
308	4.13 Form DCCN -2 Data Center Host Servers: "The solution should provide simple and effective centralized management for VM templates, virtual appliances, ISO images and scripts. Containerized workloads and services management,"	What are the scripts using for? To inject in the VM or just for the management? Does "Containerized workloads" mean that the solution needs to provide container service?	Please kindly refer to Answers to Questions No. 88 & 130 above.

SI	Ref	Question	Answer
309	4.13 Form DCCN -2 Data Center Host Servers: "The solution must provide VM machine mobility by providing clusters that span two DC	Does it mean that provide VM online migration between two DC? "	Please kindly refer to Answer to Question No. 89 above.
310	4.13 Form DCCN -2 Data Center Host Servers: "Configuration changes and automatically alert the system administrators if a host falls out of compliance."	What kind of configuration to be changes? Alert the system administrator by mail? Or just a see alarm on the management platform.	Please kindly refer to Answer to Question No. 90 above.
311	4.13 Form DCCN -2 Data Center Host Servers: "The solution should support workload balancing whether automated or manual. The solution should provide a dashboard for workload planning and balancing."	Does it means that need a portal for VM provisioning, and automatic backend balancing between different servers and storage. Or you want to configure the workload of VM provisioning and configure the policy of the balancing?	Please kindly refer to Answer to Question No. 91 above.

SI	Ref	Question	Answer
312	<p>4.13 Form DCCN -2 Data Center Host Servers:            "The solution must be able to avoid application downtime for planned storage maintenance by migrating live virtual machine disk files across storage arrays"</p>	<p>Does it include two suites of storage of the VM cluster? If yes, is it ok to automatic synchronize date between the two storage, you can planned storage maintenance with no data loss or downtime.</p>	<p>Please kindly refer to Answer to Question No. 92 above.</p>
313	<p>4.13 Form DCCN -2 Data Center Host Servers:            "The solution must deliver storage-efficient backups, de-duplication, rapid recovery and WAN-optimized replication for DR."</p>	<p>Do you really need De-duplication and WAN-optimized which cause the performance down?</p>	<p>Please kindly refer to Answer to Question No. 93 above.</p>
314	<p>4.13 Form DCCN -2 Data Center Host Servers:            "The solution must be able to provide continuous availability of any application in the event of a hardware failure – with no data loss or downtime."</p>	<p>Does the "hardware" include the storage and server? If VM only running on one server and one storage, failure of this server or storage will cause downtime.</p>	<p>Please kindly refer to Answer to Question No. 94 above.</p>

SI	Ref	Question	Answer
315	4.13 Form DCCN -2 Data Center Host Servers: "The solution must provide efficient, array-agnostic replication of virtual machine data over the LAN or WAN. The solution should be able to support replication at the virtual machine-level."	Does it mean that backup the virtual machine?	Please kindly refer to Answer to Question No. 95 above.
316	4.13 Form DCCN -2 Data Center Host Servers: "The solution must provide capability for encryption for VM data and disks"	What is the scenario? Encryption of disk will cause the performance down, is it OK while the platform Isolate disks of different tenants to ensure security.	Please kindly refer to Answer to Question No. 96 above.
317	4.13 Form DCCN -2 Data Center Host Servers : "The solution must have support for High Availability across two data centers"	Is it high availability for VM, or including hardware equipment?	Please kindly refer to Answer to Question No. 97 above.

SI	Ref	Question	Answer
318	SECTION VII. ->0.2 Business Objectives of the Purchaser: "Upgrade and Installation of additional ICT infrastructure at the existing DC sites"	<p>What is the scope of the Upgrade?</p> <p>Is there any equipment to reuse for the cloud platform?</p> <p>Or just create a new cloud platform and migrate the application to the cloud platform?</p>	Create new cloud and migrate existing server to it.
319	<p>B. BUSINESS FUNCTION AND PERFORMANCE REQUIREMENTS-&gt;1.1 BUSINESS REQUIREMENTS TO BE MET BY THE SYSTEM:</p> <p>To advance from the current traditional system setup to a hybrid IT setup that shall enable virtualization/containerization to run a private cloud, with end to end visibility into infrastructure performance metrics</p>	<p>In addition to virtualization, is the container also needed?</p> <p>What do you need, a virtualization platform or a cloud platform?</p>	<p>Containerized environment is optional for better enhancement.</p> <p>Virtualization and enterprise private cloud.</p>

SI	Ref	Question	Answer
320	: “Each data center shall be composed of five (5) zones” What is the equipment requirement (quantity/capacity/performance) for each zone.	All of these five zones will use virtualization?	<p>Bidders are to submit a fully compliant solution as specified within the IFB.</p> <p>Bidders are also free to design/propose alternative solution(s) which may provide efficiencies whilst still maintaining full compliance with the IFB requirements.</p>
321	1.3 IMPLEMENTATION SERVICES: “Migration of virtual to virtual systems ”	What is the existing virtualization platform?	The virtualized servers in the primary DC.
322	1.3 IMPLEMENTATION SERVICES: “Provide configuration to migrate existing systems data in the existing datacenters to the new storage systems ”?	<p>What is the existing storage?</p> <p>What is the capacity of the storage?</p>	Existing storage is about 60T and 300T; expandable will be needed.

SI	Ref	Question	Answer
S323	1.3 IMPLEMENTATION SERVICES: "Achieve Active-Standby Continuous Replication"	<p>What is the scenario of the storage replication?</p> <p>Normally the replication of storage is used by cloud platform automatically while the storage is using for the cloud platform.</p>	Both primary and secondary DC will be active active, the standby here refers to the DR site.
324	2.1.3 Data Center Interconnect (DCI) : "All subnets will be configured as VLAN"	Is that OK if configuring the vxLAN for the business VM?	VxLAN can be configured if better justify than VLAN. You are the SME.
325	System Inventory Table 5.1.12: "SDS ready Modular Disk Arrays"	<p>Does "Modular Disk Array" mean that a X86 server?</p> <p>Does this disk arrays be used as the storage of the cloud platform?</p>	Modular disk array are storage solution that can be replaced by x86 servers with disks for SDS. The choice of one or the other will depend on what the application supports.

SI	Ref	Question	Answer
326	2.1.12 Storage and Backup: "The storage components whether SAN or distributed object store (SDS) will be interconnected across the two DC's via a dedicated DCI link."	Is this "SDS" the same as the one in "2.2.2.1 SDS Management software"?	Please kindly refer to Answers to Questions No. 234 above.
327	2.2.2.1 SDS Management software	Does this "SDS Management software" means the Distributed storage software which run on the X86 server?	Please kindly refer to Answers to Questions No. 235 above.
328	2.2.2.2 Modular Storage Array	Does this "Modular Storage Array" means X86 server which to deploy the Distributed storage software?	Please kindly refer to Answers to Questions No. 236 above.
329	2.1.12 Storage and Backup	Do all of the zones use the same storage? Is the backup storage the same as the production storage?	Please kindly refer to Answers to Questions No. 237 above.



SI	Ref	Question	Answer
330	2.1.13 Disaster Recovery (DR)	What is the requirement about the DR? Does the application have the ability of the Disaster Recovery?	Please kindly refer to Answers to Questions No. 238 above.