INFORMATION AND COMMUNICATION TECHNOLOGY AGENCY OF SRI LANKA

BIDDING DOCUMENT

NATIONAL COMPETITIVE BIDDING (NCB)

FOR

PROCUREMENT OF SERVICES FOR INSTALLATION, CONFIGURATION AND MAINTENANCE OF APPLICATION STACKS FOR THE LANKA GOVERNMENT CLOUD 2.0

INVITATION FOR BIDS No: ICTA/GOSL/SER/NCB/2016/26

AUGUST, 2016

Information and Communication Technology Agency of Sri Lanka

Invitation for Bids (IFB)

PROCUREMENT OF SERVICES FOR INSTALLATION, CONFIGURATION AND MAINTENANCE OF APPLICATION STACKS FOR LANKA GOVERNMENT CLOUD 2.0- **IFB No: ICTA/GOSL/SER/NCB/2016/26**

1. Information and Communication Technology Agency of Sri Lanka (ICTA) which functions under the purview of Ministry of Telecommunication and Digital Infrastructure, has initiated implementation of several initiatives across the government by developing and improving digital infrastructure as a key area to increase the efficiency of the government processes and to provide government services effectively and efficiently in line with the national policy of 'Digitization of Economy'.

2. As a priority project, ICTA has already taken steps to procure bare-metal server facilities to implement an industry standard cloud environment to serve as the 'Lanka Government Cloud 2.0' (LGC 2.0) to provide efficient, cost effective, reliable and secure infrastructure services. There is a requirement for having application stacks on top of the bare-metal server facilities.

3. The Chairman, Project Procurement Committee (PPC), on behalf of Information and Communication Technology Agency of Sri Lanka (ICTA), now invites sealed Bids from eligible and qualified Bidders for providing services for Installation, Configuration and Maintenance of following Application Stacks for LGC 2.0 for which this IFB is issued;

   Lot-1: OpenStack based Cloud
   Lot-2: Mesosphere
   Lot-3: Hadoop Distribution

   Bidders at their option are allowed to bid for any single lot or any combination of Lots or for all Lots. Each Lot shall be evaluated separately. Detailed Description of Services required is given in the Bidding Document.

4. Bidding will be conducted using the National Competitive Bidding (NCB) procedure as defined in Procurement Guidelines of Democratic Socialist Republic of Sri Lanka (GoSL) and is open to all eligible Bidders that meet the qualifications requirements specified in the Bidding Documents.

5. Interested eligible Bidders may obtain further information from Procurement Division, ICTA, 160/24, 2nd Floor, Kirimandala Mawatha, Colombo 05 and inspect the Bidding documents free of charge during office hours (0900 Hrs 1700 Hrs) on working days commencing from **August 19, 2016** at the office of ICTA at the above address. Telephone:

2369099, Facsimile: 2369091 Email: procurement@icta.lk. Bidding documents are available on https://www.icta.lk/procurement/ only for reference purposes and interested eligible Bidders shall purchase the Bidding Documents as described in paragraph (6) below.

6. A complete set of Bidding Documents in English Language may be purchased by interested Bidders on submission of a written application and upon payment of a non-refundable fee of Sri Lankan Rupees Fifteen Thousand (LKR 15,000.00) effective from **August 19, 2016** during office hours on working days from the office of the ICTA at the address given in paragraph (5) above. The method of payment will be by cash.

7. A pre-bid meeting which potential Bidders may attend will be held at **1400 Hrs (2.00 PM) on August 31, 2016** at the office of ICTA at the address given in paragraph (5) above.

8. Bids in hard copies (As per ITB 20 of Bidding Document) must be delivered to Director-Procurement, C/o Managing Director/Chief Executive Officer, Information and Communication Technology Agency of Sri Lanka (ICTA), 160/24, 2nd Floor, Kirimandala Mawatha, Colombo 05 at or before **1500 Hrs (3.00 P.M) on September 20, 2016.** Late Bids will not be accepted and will be rejected.

9. All Bids must be accompanied by a Bid Security in the form of a Bank Guarantee using the format given in the Bidding Documents in the amount of Sri Lankan Rupees One Million (LKR 1 Million) for each Lot.

10. Bids shall be valid for a period of 90 days from the date of deadline for submission of the Bids.

11. Bids will be opened immediately after the deadline for submission of bids, in the presence of Bidders or their authorized representatives who choose to attend in person at the office of ICTA at the address given in paragraph (5) above.

12. ICTA will not be responsible for any costs or any expenses incurred by the Bidders in connection with the preparation or delivery of Bids.

Chairman
Project Procurement Committee
Information and Communication Technology Agency of Sri Lanka
60/24, 2nd Floor, Kirimandala Mawatha
Colombo 05

August 18, 2016

Section 1
Instructions to Bidders

A. General

1. Scope of Bid   1.1   The Employer, as defined in the **Bidding Data Sheet (BDS)**, invites bids for the Services, as described in the Appendix A to the Contract. The name and identification number of this National Competitive Bidding (NCB) Contract is **provided in the BDS.**

   1.2   The successful Bidder will be expected to complete the performance of the Services by the Intended Completion Date **provided in the BDS.**

2. Source of Funds   2.1   Payments under this contract will be financed by the source **specified in the BDS.**

3. Corrupt or Fraudulent Practices   3.1   The attention of the bidders is drawn to the followings:

- Parties associated with Procurement Actions, namely, suppliers/contractors and officials shall ensure that they maintain strict confidentiality throughout the process;

- Officials shall refrain from receiving any personal gain from any Procurement Action. No gifts or inducement shall be accepted. Service providers/Suppliers/contractors are liable to be disqualified from the bidding process if found offering any gift or inducement which may have an effect of influencing a decision or impairing the objectivity of an official.

   3.2   The Employer requires the bidders, suppliers, service providers, and consultants to observe the highest standard of ethics during the procurement and execution of such contracts. In pursuit of this policy:

     a) *"corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the action of a public official in the procurement process or in contract execution;*

     b) *"fraudulent practice" means a misrepresentation or omission of facts in order to influence a procurement process or the execution of a contract;*

     c) *"collusive practice" means a scheme or arrangement between two or more bidders, with or without the knowledge of the Employer to establish bid prices at*

artificial, noncompetitive levels; and

d) *"coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the procurement process or affect the execution of a contract.*

3.3 If the Employer found any unethical practices as stipulated under ITB Clause 3.2, the Employer will reject a bid, if it is found that a Bidder directly or through an agent, engaged in corrupt, fraudulent, collusive or coercive practices in competing for the Contract in question.

4. Eligible Bidders 4.1 All bidders shall possess legal rights to supply the Services under this contract.

4.2 A Bidder shall not have a conflict of interest. All bidders found to have conflict of interest shall be disqualified. Bidders may be considered to have a conflict of interest with one or more parties in this bidding process, if they:

(a) are or have been associated in the past, with a firm or any of its affiliates which have been engaged by the Employer to provide consulting services for the preparation of the design, specifications, and other documents to be used for the procurement of the services to be purchased under these Bidding Documents ; or

4.3 A Bidder that is under a declaration of ineligibility by the Government of Sri Lanka (GOSL), at the date of submission of bids or at the date of contract signing, shall be disqualified.

4.4 Foreign Bidder may submit a bid only if so stated in the BDS.

5. Qualification of the Bidder 5.1 All bidders shall provide in Section III, Bidding Forms, a preliminary description of the proposed work method and schedule, including drawings and charts, as necessary.

5.2 In the event that prequalification of potential bidders has been undertaken **as stated in the BDS**, only bids from pre-qualified bidders shall be considered for award of Contract, in which case the provisions of sub-clauses 5.3 to 5.6 hereafter shall not apply. These qualified bidders should submit with their bids any information updating their original prequalification applications or, alternatively, confirm in their bids that the originally submitted prequalification information remains essentially correct as of the date of bid submission.

5.3 If the Employer has not undertaken prequalification of potential bidders, all bidders shall include the following information and documents with their bids, unless otherwise

stated in the BDS:

(a) copies of original documents defining the constitution or legal status, place of registration, and principal place of business; written power of attorney of the signatory of the Bid to commit the Bidder;

(b) total monetary value of Services performed for each of the last three years;

(c) experience in Services of a similar nature and size for each of the last three years, and details of Services under way or contractually committed; and names and address of clients who may be contacted for further information on those contracts;

(d) list of major items of equipment proposed to carry out the Contract;

(e) qualifications and experience of key site management and technical personnel proposed for the Contract;

(f) reports on the financial standing of the Bidder, such as profit and loss statements and auditor's reports for the past five years;

(g) evidence of adequacy of working capital for this Contract (access to line(s) of credit and availability of other financial resources);

(h) authority to the Employer to seek references from the Bidder's bankers; and

(i) information regarding any litigation, current or during the last three years, in which the Bidder is involved, the parties concerned, and disputed amount;

5.4 Bids submitted by a joint venture of two or more firms as partners shall comply with the following requirements, unless otherwise stated in the **BDS**:

(a) the Bid shall include all the information listed in ITB Sub-Clause 5.3 above for each joint venture partner;

(b) the Bid shall be signed so as to be legally binding on all partners;

(c) the Bid shall include a copy of the agreement entered into by the joint venture partners defining the division of assignments to each partner and establishing that all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms; alternatively, a Letter of Intent to execute a joint venture agreement, prior to the signing of

the Contract, in the event of a successful bid shall be signed by all partners and submitted with the bid, together with a copy of the proposed agreement;

(d) one of the partners shall be nominated as being in charge, authorized to incur liabilities, and receive instructions for and on behalf of any and all partners of the joint venture; when a foreign partner/s is/are involved one of the local partners shall be nominated as being in charge; and

(e) the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.

5.5 To qualify for award of the Contract, bidders shall meet the following minimum qualifying criteria:

(a) annual volume of Services of at least the amount **specified in the BDS;**

(b) experience as service provider in the provision of at least two service contracts of a nature and complexity equivalent to the Services over the last Three (03) years **as specified in the BDS;**

(c) proposals for the timely acquisition (own, lease, hire, etc.) of the essential equipment **listed in the BDS**;

(d) a Project Manager with Five (05) years' experience in Services of an equivalent nature and volume, including no less than Three (03) years as Manager; and

(e) liquid assets and/or credit facilities, net of other contractual commitments and exclusive of any advance payments which may be made under the Contract, of no less than the amount specified in the **BDS**.

5.6 A history of awards against the bidder or any partner of a Joint Venture in litigation or in Arbitration may result in disqualification of the bid.

5.7 The figures for each of the partners of a joint venture shall be added together to determine the Bidder's compliance with the minimum qualifying criteria of ITB Sub-Clause 5.5(a) and (e); however, for a joint venture to qualify the partner in charge must meet at least 75 percent of those minimum criteria for an individual Bidder and other partners at least 40 percent of the criteria. Failure to comply with this requirement will result in rejection of the joint venture's Bid.

6. One Bid per Bidder

6.1 Each Bidder shall submit only one Bid, either individually or as a partner in a joint venture. A Bidder who submits or participates in more than one Bid will cause all the proposals

with the Bidder's participation to be disqualified.

7. Cost of Bidding	7.1	The Bidder shall bear all costs associated with the preparation and submission of his Bid, and the Employer will in no case be responsible or liable for those costs.
8. Site Visit	8.1	The Bidder, at the Bidder's own responsibility and risk, may visit and examine the Site of required Services and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for the Services. The costs of visiting the Site shall be at the Bidder's own expense.

B. Bidding Documents

9. Content of Bidding Documents	9.1	The set of bidding documents comprises the documents listed in the table below and addenda issued in accordance with ITB Clause 11:

Section I — Instructions to Bidders

Section II — Bidding Data Sheet

Section III — Bidding Forms

Section IV — Eligible countries (Not applicable)

Section V — Activity Schedule (Description of services)

Section VI — General Conditions of Contract

Section VII — Special Conditions of Contract

Section VIII — Performance Specifications and Drawings (if Applicable)

Section IX — Contract Forms

9.2 The Bidder is expected to examine all instructions, forms, terms, and specifications in the bidding documents. Failure to furnish all information required by the bidding documents or to submit a bid not substantially responsive to the bidding documents in every respect will be at the Bidder's risk and may result in the rejection of its bid. Sections III, V, and IX should be completed and returned with the Bid in the number of copies specified in the **BDS**.

10. Clarification of Bidding Documents	10.1	A interested Bidder requiring any clarification of the bidding documents may notify the Employer by email at the Employer's address indicated in the invitation to bid. The Employer will respond to any request for clarification received earlier than 10 days prior to the deadline for submission of bids. Copies of the Employer's response will be forwarded to all Bidders who have purchased the bidding documents, including a description of the inquiry, but without identifying its source.
11. Amendment of	11.1	Before the deadline for submission of bids, the Employer may

Bidding Documents	modify the bidding documents by issuing addenda.

11.2 Any addendum thus issued shall be part of the bidding documents and shall be communicated by e-mail to all Bidders of the bidding documents. Prospective bidders shall acknowledge receipt of each addendum by email to the Employer.

11.3 To give prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer shall extend, as necessary, the deadline for submission of bids, in accordance with ITB Sub-Clause 21.2 below.

C. Preparation of Bids

12. Language of Bid

12.1 The Bid, as well as all correspondence and documents relating to the Bid (including supporting documents and printed literature) exchanged by the Bidder and the Employer, shall be written in English language. In the event a document in a language other than English need be submitted, an official translation of the same in English need be submitted along with the document, and the content of the translated document shall only be recognized.

13. Documents Comprising the Bid

13.1 The Bid submitted by the Bidder shall comprise the following:

(a) The Form of Bid (in the format indicated in Section III);

(b) Bid Security;

(c) Priced Activity Schedule;

(d) Qualification Information Form and Documents;

and any other materials required to be completed and submitted by bidders, as **specified in the BDS**.

14. Bid Prices

14.1 The Contract shall be for the Services, as described in Appendix A to the contract and in the Specifications, Section VIII, based on the priced Activity Schedule, Section V, submitted by the Bidder.

14.2 The Bidder shall fill in rates and prices for all items of the Services described in the in Specifications (or Description of services), Section VIII and listed in the Activity Schedule, Section V. Items for which no rate or price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed covered by the other rates and prices in the Activity Schedule.

14.3 The Service Provider and its Personnel shall pay such taxes, duties, fees, and other impositions as may be levied under the Applicable Law, the amount of which is deemed to have been included in the Contract Price. However, VAT shall not be included in the price but shall be indicated separately.

14.4 The Prices quoted by the Bidder shall be fixed during the Bidder's performance of the Contract and not subject to variation on any account. A bid submitted with an adjustable price quotation will be treated as non-responsive and rejected

14.5 For the purpose of determining the remuneration due for additional Services, a breakdown of the lump-sum price shall be provided by the Bidder in the form of Appendix E to the Contract.

15. Currencies of Bid and Payment

15.1 The Bidder shall quote in Sri Lankan Rupees for local services and the payment shall be made for such services in Sri Lankan Rupees.

15.2 The Bidder may quote in US Dollars for services for which foreign currencies involved. And the Bidder may be required by the Employer to justify to the Employer's satisfaction for such foreign currency requirements if any.

16. Bid Validity

16.1 Bids shall remain valid until the date specified in the **BDS**. A bid valid for a shorter date shall be rejected by the Employer as non responsive.

16.2 In exceptional circumstances, prior to the expiration of the bid validity date, the Employer may request bidders to extend the period of validity of their bids. The request and the responses shall be made in writing. If a Bid Security is requested in accordance with ITB Clause 17, it shall also be extended for a corresponding period. A Bidder may refuse the request without forfeiting its Bid Security. A Bidder granting the request shall not be required or permitted to modify its bid.

17. Bid Security

17.1 The Bidder shall furnish as part of its bid, a Bid Security or a Bid-Securing Declaration, as specified in the **BDS**.

17.2 The Bid Security shall be in the amount specified in the **BDS** and denominated in Sri Lankan Rupees, and shall:

(a) at the bidder's option, be in the form of either a bank draft, a letter of credit, or a bank guarantee from a banking institution;

(b) be issued by any commercial bank licensed by the Central Bank of Sri Lanka.

(c) be substantially in accordance with the form of Bid

Security included in Section III, Bidding Forms,

(d) be payable promptly upon written demand by the Employer in case the conditions listed in ITB Sub-Clause 17.5 are invoked;

(e) be submitted in its original form; copies will not be accepted;

(f) remain valid for a period of 28 days beyond the validity period of the bids, as extended, if applicable, in accordance with ITB Sub-Clause 16.2;

17.3 If a Bid Security or a Bid- Securing Declaration is required in accordance with ITB Sub-Clause 17.1, any bid not accompanied by a substantially responsive Bid Security or Bid Securing Declaration in accordance with ITB Sub-Clause 17.1, shall be rejected by the Employer as non-responsive.

17.4 The Bid Security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's furnishing of the Performance Security pursuant to ITB Clause 35.

17.5 The Bid Security may be forfeited or the Bid Securing Declaration executed:

(a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Bid Submission Form, except as provided in ITB Sub-Clause 16.2; or

(b) if the successful Bidder fails to:

(i) sign the Contract in accordance with ITB Clause 34;

(ii) furnish a Performance Security in accordance with ITB Clause 35.

17.6 The Bid Security or Bid- Securing Declaration of a JV must be in the name of the JV that submits the bid. If the JV has not been legally constituted at the time of bidding, the Bid Security or Bid-Securing Declaration shall be in the names of all future partners as named in the letter of intent to constitute the JV.

18. Alternative Proposals by Bidders   18.1 Alternative bids shall not be considered.

19. Format and Signing of Bid   19.1 The Bidder shall prepare one original of the documents comprising the Bid as described in ITB Clause 11 of these Instructions to Bidders, bound with the volume containing the Form of Bid, and clearly marked "ORIGINAL." In addition, the Bidder shall submit copies of the Bid, in the number **specified in the BDS,** and clearly marked as "COPIES." In the event of

discrepancy between them, the original shall prevail.

19.2 The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder, pursuant to Sub-Clauses 5.3(a) or 5.4(b), as the case may be. All pages of the Bid where entries or amendments have been made shall be initialed by the person or persons signing the Bid.

19.3 The Bid shall contain no alterations or additions, except those to comply with instructions issued by the Employer, or as necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by the person or persons signing the Bid.

D. Submission of Bids

20. Sealing and Marking of Bids

20.1 The Bidder shall seal the original and all copies of the Bid in two inner envelopes and one outer envelope, duly marking the inner envelopes as "ORIGINAL" and "COPIES".

20.2 The inner and outer envelopes shall

    (a) bear the name and address of the Bidder;

    (b) be addressed to the Employer at the address provided in the **BDS**

    (c) **bear the name and identification number of the Contract as** defined in the BDS and

    (d) provide a warning not to open before the specified time and date for Bid opening as **defined in the BDS**

20.3 In addition to the identification required in ITB Sub-Clause 20.2, the inner envelopes shall indicate the name and address of the Bidder to enable the Bid to be returned unopened in case it is declared late, pursuant to ITB Clause 22.

20.4 If the outer envelope is not sealed and marked as above, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.

21. Deadline for Submission of Bids

21.1 Bids shall be delivered to the Employer at the address specified above (Refer 20.2 (b)) no later than the time and date **specified in the BDS.**

21.2 The Employer may extend the deadline for submission of bids by issuing an amendment in accordance with ITB Clause 11, in which case all rights and obligations of the Employer and the bidders previously subject to the original deadline will then be subject to the new deadline.

22. Late Bids	22.1	The Employer shall not consider any bid that reaches after the deadline for submission of bids. Any bid received by the Employer after the deadline for submission of bids shall be declared late, rejected, and returned unopened to the Bidder.
23. Modification and Withdrawal of Bids	23.1	Bidders may modify or withdraw their bids by giving notice in writing before the deadline prescribed in ITB Clause 21.
	23.2	Each Bidder's modification or withdrawal notice shall be prepared, sealed, marked, and delivered in accordance with ITB Clauses 19 and 20, with the outer and inner envelopes additionally marked "MODIFICATION" or "WITHDRAWAL," as appropriate.
	23.3	No Bid may be modified after the deadline for submission of Bids.
	23.4	Withdrawal of a Bid between the deadline for submission of bids and the expiration of the period of Bid validity specified in the BDS or as extended pursuant to ITB Sub-Clause 16.2 may result in the forfeiture of the Bid Security pursuant to ITB Clause 17.
	23.5	Bidders may only offer discounts to, or otherwise modify the prices of their bids by submitting Bid modifications in accordance with this clause, or included in the original Bid submission.

E. Bid Opening and Evaluation

24. Bid Opening	24.1	The Employer will open the bids, including modifications made pursuant to ITB Clause 23, in the presence of the bidders' representatives who choose to attend at the time and in the place **specified in the BDS.**
	24.2	Envelopes marked "WITHDRAWAL" shall be opened and read out first. Bids for which an acceptable notice of withdrawal has been submitted pursuant to ITB Clause 23 shall not be opened.
	24.3	The bidders' names, the Bid prices, the total amount of each Bid and of any alternative Bid (if alternatives have been requested or permitted), any discounts, Bid modifications and withdrawals, the presence or absence of Bid Security, and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening. No bid shall be rejected at bid opening except for the late bids pursuant to ITB Clause 22; Bids, and modifications, sent pursuant to ITB Clause 23 that are not opened and read out at bid opening will not be considered for further evaluation regardless of the circumstances. Late and withdrawn bids will be returned unopened to the bidders.

24.4 The Employer will prepare minutes of the Bid opening, including the information disclosed to those present in accordance with ITB Sub-Clause 24.3.

25. Process to Be Confidential

25.1 Information relating to the examination, clarification, evaluation, and comparison of bids and recommendations for the award of a contract shall not be disclosed to bidders or any other persons not officially concerned with such process. Upon the award to the successful bidder, the details of which may be availed on request. Any effort by a Bidder to influence the Employer's processing of bids or award decisions may result in the rejection of his Bid.

25.2 If, after notification of award, a bidder wishes to ascertain the grounds on which its bid was not selected, it should address its request to the Employer, who will provide written explanation indicating specific short-comings. Any request for explanation from one bidder should relate only to its own bid; information about the bid of competitors will not be addressed.

26. Clarification of Bids

26.1 To assist in the examination, evaluation, and comparison of bids, the Employer may, at the Employer's discretion, ask any Bidder for clarification of the Bidder's Bid, including breakdowns of the prices in the Activity Schedule, and other information that the Employer may require. The request for clarification and the response shall be in writing, but no change in the price or substance of the Bid shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids in accordance with ITB Clause 28.

26.2 Subject to ITB Sub-Clause 26.1, no Bidder shall contact the Employer on any matter relating to its bid from the time of the bid opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of the Employer, he should do so in writing.

26.3 Any effort by the Bidder to influence the Employer in the Employer's bid evaluation or contract award decisions may result in the rejection of the Bidder's bid.

27. Examination of Bids and Determination of Responsiveness

27.1 Prior to the detailed evaluation of bids, the Employer will determine whether each Bid (a) meets the eligibility criteria defined in ITB Clause 4; (b) has been properly signed; (c) is accompanied by the required securities; and (d) is substantially responsive to the requirements of the bidding documents.

27.2 A substantially responsive Bid is one which conforms to all the terms, conditions, and specifications of the bidding documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the Services; (b) which limits

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in any substantial way, inconsistent with the bidding documents, the Employer's rights or the Bidder's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

27.3 If a Bid is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.

28. Correction of Errors

28.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Arithmetical errors will be rectified by the Employer on the following basis: if there is a discrepancy between unit prices and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail, and the total price shall be corrected; if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; if there is a discrepancy between the amounts in figures and in words, the amount in words will prevail.

28.2 The amount stated in the Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and, with the concurrence of the Bidder, shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected amount, the Bid will be rejected, and the Bid Security may be forfeited in accordance with ITB Sub-Clause 17.5(b).

29. Currency for Bid Evaluation

29.1 For evaluation and comparison purposes, the currency (ies) of the bid shall be converted into a single currency as specified in the BDS.

30. Evaluation and Comparison of Bids

30.1 The Employer will evaluate and compare only the bids determined to be substantially responsive in accordance with ITB Clause 27.

30.2 In evaluating the bids, the Employer will determine for each Bid the evaluated Bid price by adjusting the Bid price as follows:

(a) making any correction for errors pursuant to ITB Clause 28;

(b) excluding provisional sums and the provision, if any, for contingencies in the Activity Schedule, Section V, but including Day work, when requested in the Specifications (or Description of services) Section VIII;

(c) making appropriate adjustments to reflect discounts or other price modifications offered in accordance with ITB

Sub-Clause 23.5.

30.3 The Employer reserves the right to accept or reject any variation, deviation, or alternative offer. Variations, deviations, and alternative offers and other factors, which are in excess of the requirements of the bidding documents or otherwise result in unsolicited benefits for the Employer will not be taken into account in Bid evaluation.

30.4 The estimated effect of any price adjustment conditions under Sub-Clause 6.6 of the General Conditions of Contract, during the period of implementation of the Contract, will not be taken into account in Bid evaluation.

31. Preference for Domestic Bidders

31.1 Domestic bidders shall not be eligible for any margin of preference in Bid evaluation.

F. Award of Contract

32. Award Criteria

32.1 The Employer shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Documents, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.

Subject to ITB Clause 33, the Employer will award the Contract to the Bidder whose Bid has been determined to be substantially responsive to the bidding documents and who has offered the lowest evaluated Bid price, provided that such Bidder has been determined to be (a) eligible in accordance with the provisions of ITB Clause 4, and (b) qualified in accordance with the provisions of ITB Clause 5.

32.2 If, pursuant to ITB Sub-Clause 13.2 this contract is being let on a "slice and package" basis, the lowest evaluated Bid Price will be determined when evaluating this contract in conjunction with other contracts to be awarded concurrently. Taking into account any discounts offered by the bidders for the award of more than one contract.

33. Employer's Right to Accept any Bid and to Reject any or all Bids

33.1 Notwithstanding ITB Clause 32, the Employer reserves the right to accept or reject any Bid, and to cancel the bidding process and reject all bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Employer's action.

34. Notification of Award and Signing of Agreement

34.1 Prior to the expiration of the period of bid validity, the Employer shall notify the successful Bidder, in writing, that its Bid has been accepted.

34.2 Until a formal Contract is prepared and executed, the notification of award shall constitute a binding Contract.

34.3 Upon the successful Bidder's furnishing of the signed Contract Form and performance security pursuant to ITB Clause 35, the Employer will promptly notify each unsuccessful Bidder and will discharge its bid security, pursuant to ITB Clause 17.4

35. Performance Security

35.1 Within fourteen (14) days of the receipt of notification of award from the Employer, the successful Bidder, if required, shall furnish the Performance Security in accordance with the GCC, using for that purpose the Performance Security Form included in Section IX Contract forms. The Employer shall promptly notify the name of the winning Bidder to each unsuccessful Bidder and discharge the Bid Securities of the unsuccessful bidders pursuant to ITB Sub-Clause 17.4. Refer BDS.

35.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security or execution of the Bid-Securing Declaration. In that event the Employer may award the Contract to the next lowest evaluated Bidder, whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.

36. Advance Payment and Security

36.1 The Employer will provide an Advance Payment on the Contract Price as stipulated in the Conditions of Contract, subject to the amount **stated in the BDS.**

Section II. Bidding Data Sheet

The following specific information relating to services to be procured and procurement procedure that will be used shall complement, supplement or amend the provisions in the Instructions to Bidders (ITB). Whenever there is a conflict the provisions in the Bid Data Sheet (BDS) shall prevail over those in the ITB.

Instructions to Bidders Clause Reference

A. General	
1.1	The Employer is: Information and Communication Technology Agency of Sri Lanka
	The name and identification number of the Contract is;
	"PROCUREMENT OF SERVICES FOR INSTALLATION, CONFIGURATION AND MAINTENANCE OF APPLICATION STACKS FOR THE LANKA GOVERNMENT CLOUD 2.0 "
	IFB No: ICTA/GOSL/SER/NCB/2016/26
	Requirements for Application Stacks are grouped into three Lots as follow;
	Lot-1: OpenStack based Cloud
	Lot-2: Mesosphere
	Lot-3: Hadoop Distribution
	Bidders at their option are allowed to bid for any single or any combination of Lots or or Lots. Each Lot shall be evaluated separately.
	Bidders are required to bid for the total requirement of services in each lot as given in description of services specified in the Bidding Documents. Bids for partial requirements shall be treated as non-responsive and shall be rejected.
1.2	Intended completion dates for commissioning and providing support and maintenance services are given below; (Start dates shall be notified for commencing implementation at least 14 days prior).
	Lot-1: OpenStack based Cloud
	Commissioning of General Cluster of LGC 2.0 by installing, configuring and testing of OpenStack based cloud for use in forty (40) days from the date of signing the contract and providing the Support and Maintenance service for a period of thirty six (36) months from the date of commissioning.
	Lot-2: Mesosphere
	Commissioning of General Cluster of LGC 2.0 by installing, configuring and testing of Mesosphere for use in thirty (30) days from the date of signing the contract and providing the Support and Maintenance service for a period of thirty six (36) months from the date of commissioning, unless otherwise terminated earlier as per the contract.
	Lot-3: Hadoop Distribution

	Commissioning of Big-data Cluster by installing, configuring and testing of Hadoop Distribution for use in forty (40) days from the date of signing the contract and providing the Support and Maintenance service for a period of thirty six (36) months from the date of commissioning, unless otherwise terminated earlier as per the contract.
2.1	The source of funding for this project is: Government of Sri Lanka (GOSL)
4.1	Apart from the capability to enter into a contract, the bidder should have the necessary authorization from the principal owner(s), and/or distributor(s) of the application stack proposed to offer in response to this invitation to bid, to provide the same in the manner expected as enumerated in this document.
4.4	Foreign bidders are allowed to bid
5.2	Prequalification of potential bidders has not been undertaken under this procurement activity.
5.3	Prequalification of potential bidders has not been undertaken this procurement activity. All bidders shall include all information and documents stated in ITB 5.3 along with their bids.
5.5(a)	The average annual volume of services performed by the Bidder over the last 3 years for each lot shall be as below; For Lot-1: Sri Lankan Rupees 50 Million For Lot-2: Sri Lankan Rupees 50 Million For Lot-3: Sri Lankan Rupees 50 Million
5.5(b)	Experience (see 5.3 (c) of BDS) as a service provider being in the business of provisioning of at least two (02) similar services for each lot over last three (03) years, and details of services under way or contractually committed, names and addresses of clients who may be contacted for further information on those contracts.
5.5(c)	Servers and other essential equipment to cover the volume of services expected to be covered under the contract.
5.5 (d)	5.5 (d) is further enhanced to include minimum number of members Project Manager with five (05) years' experience in service of an equivalent nature and volume of the services, including no less than Three (03) years as a Manager shall be nominated for the contract for each Lot separately. Minimum of Professional team of expert as stated below for each lot in the respective domain/discipline having minimum experience as given in Description of Services. (Refer Appendix C) Lot-1: 5 Members Lot-2: 5 Members Lot-3: 6 Members
5.5(e)	Bidder must demonstrate access to or availability of financial resources such as liquid assets, un-encumbered real assets, line of credit and other financial means other than any contractual payments to be received under this contract to meet the

cash flow requirement as stated below or equivalent, and net of the Bidder's other commitments.

Lot-1: Sri Lankan Rupees 25 Million

Lot-2: Sri Lankan Rupees 25 Million

Lot-3: Sri Lankan Rupees 25 Million

B. Bidding Data

9.2 and 19.1	The number of copies of the Bid to be completed and submitted shall be one in addition to the original bid.
10.1	Pre Bid meeting shall be held at the office of the Information and Communication Technology Agency of Sri Lanka at 160/24, 2nd Floor, Kirimandala Mawatha, Colombo 05 on the following date and time Date: **31 August, 2016** Time: **1400 hrs (2.00 P.M)** Clarifications provided in response to the questions may also be published in the web (https://www.icta.lk/procurement/) without stating the source of the question.
11.2	All addenda may also be published in web (https://www.icta.lk/procurement/)
13.1	Any other additional materials to be submitted with the bid as required and specified in the Bidding Documents
16.1	The period of Bid validity shall be 90 days from the deadline for Bid submission. Accordingly, bids should be valid till **19 December, 2016.**
17.1	The Bidder shall provide: Bid Security in the form of a Bank Guarantee (as per the format given in the Bidding Document) Bid Security shall be issued in favour of; Chairperson, Information and Communication Technology Agency of Sri Lanka, 160/24, 2nd Floor, Kirimandala Mawatha, Colombo 05.
17.2	Bid Security shall be in the amount as stated below in the form of Bank Guarantee. Lot-1: Sri Lankan Rupees 1 Million Lot-2: Sri Lankan Rupees 1 Million Lot-3: Sri Lankan Rupees 1 Million Each bid must be accompanied by Bid Security in the above amounts in Sri Lankan Rupees for each Lot. If a bidder bids for more than one Lot, bidder may submit one Bid Security covering the total amount of specified amounts of the respective Lots. Lots covered under the Bid Security shall be stated in the Bid Security.
17.2 (a)	Bid Security shall be in the form of a Bank Guarantee (as per the format given in the Bidding Documents).
17.2 (f)	Bid securities shall be valid for 28 days beyond the validity period of the bids. Accordingly, Bid Securities shall remain valid till **16 January, 2017**.

19,1	The number of copies of the Bid to be completed and submitted shall be one in addition to the original bid.

D. Submission of Bids

20.2 (b)	Address is: Director - Procurement and Head of Administration C/o, Managing Director/Chief Executive Officer Information and Communication Technology Agency of Sri Lanka, 160/24, 2nd Floor, Kirimandala Mawatha, Colombo 05.
20.2 (c)	Name and identification number: **Name of Contract: "Procurement of Services for Installation, Configuration and Maintenance of Application Stacks for the Lanka Government Cloud 2.0 "** **Identification number of Contract No:** **ICTA/GOSL/SER/NCB/2016/26- Lot-1: OpenStack based Cloud** **ICTA/GOSL/SER/NCB/2016/26- Lot-2: Mesosphere** **ICTA/GOSL/SER/NCB/2016/26- Lot-3: Hadoop Distribution**
20.2 (d)	Shall be marked "Bids shall not be opened prior to deadline for submission of bids".
21.1	**The deadline for submission of bids shall be:** **Time: at or before 1500hrs (3.00 P.M)** **Date: 20 September, 2016.**

E. Bid Opening and Evaluation

24.1	Bids will be opened immediately after the deadline for submission of bids at the address of; Information and Communication Technology Agency of Sri Lanka, 160/24, 2nd Floor, Kirimandala Mawatha, Colombo 05.
29.1	The currency that shall be used for bid evaluation and comparison purposes is to convert all bid prices expressed in foreign currencies into a single currency, Sri Lankan Rupees. The source of exchange rate shall be daily indicative exchange rate of foreign currencies published by the Central Bank of Sri Lanka. The date of exchange rate shall be the date of deadline for submission of bids.
30.3	Alternative bids shall not be considered.
31.1	Not Applicable

F. Award of Contract

32	**Following paragraph is added to clause 32.1**
	At the time the Contract is awarded, the Employer reserves the right to increase or decrease the quantity of Related Services originally specified in Appendix A – (Description of Services) such that a change of 25% in the total monthly value payable The indicative prices stated in Appendix B would be taken into account in determining the variation of corresponding equipment provided in effecting such modifications.
35	The Performance Security acceptable to the Employer shall be the in the Standard Form of unconditional Bank Guarantee (as per the format given in the Bidding Document) issued by any commercial bank licensed by the Central Bank of Sri Lanka and the amount shall be 10% of the total contract price. Performance security shall be submitted within 07 working days of the date of notification of award from the employer.
36.1	Not applicable

Section III. Bidding Forms

Table of Forms

Service Provider's Bid

To: Chairperson
Information and Communication Technology Agency of Sri Lanka
160/24, Kirimandala Mawatha
Colombo 05

Having examined the bidding documents including addenda No ……..,
we.....................(name of the bidder) offer to execute the services of **"Installation,
Configuration and Maintenance of Application Stacks for Lanka Government
Cloud 2.0"** in accordance with the Conditions of Contract, specifications, drawings and
all activities stated in the Description of Services accompanying this Bid as stated in the
tables below for three Lots separately at Sri Lanka Rupees …................. indicated in the
Table below *excluding Value Added Tax (VAT)*.

All other levies applicable shall be included in to the price (ITB 14.3).

Lot-1:

#	Description	Total Price Excluding VAT (a1)		Price per month Excluding VAT (b1)		No. of months	Total Price for 36 months Excluding VAT (c1)	
1	Installation, Configuration, Testing and Commissioning of OpenStack Based Cloud for General Cluster of Lanka Government Cloud 2.0 as specified in the Bid in response to requirements specified in the Bidding Documents	in Sri Lanakan Rupees	In USD	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
2	Providing Support and Maintenance services for a period of 36 months from the date of commissioning.	Not Applicable	Not Applicable	in Sri Lanakan Rupees	In USD	36	in Sri Lanakan Rupees	In USD
	TOTAL	**(a1) + (c1)**						

Lot-2

#	Description	Total Price Excluding VAT (a2)		Price per month Excluding VAT (b2)		No. of months	Total Price for 36 months Excluding VAT (c2)	
1	Installation, Configuration, Testing and Commissioning of OpenStack Based Cloud for General Cluster of Lanka Government Cloud 2.0 as specified in the Bid in response to requirements specified in the Bidding Documents	in Sri Lanakan Rupees	In USD	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
2	Providing Support and Maintenance services for a period of 36 months from the date of commissioning.	Not Applicable	Not Applicable	in Sri Lanakan Rupees	In USD	36	in Sri Lanakan Rupees	In USD
	TOTAL	**(a2) + (c2)**						

Lot-3

#	Description	Total Price Excluding VAT (a3)		Price per month Excluding VAT (b3)		No. of months	Total Price for 36 months Excluding VAT (c3)	
1	Installation, Configuration, Testing and Commissioning of OpenStack Based Cloud for General Cluster of Lanka Government Cloud 2.0 as specified in the Bid in response to requirements specified in the Bidding Documents	in Sri Lanakan Rupees	In USD	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
2	Providing Support and Maintenance services for a period of 36 months from the date of commissioning.	Not Applicable	Not Applicable	in Sri Lanakan Rupees	In USD	36	in Sri Lanakan Rupees	In USD
	TOTAL	**(a3) + (c3)**						

This Bid and your written acceptance of it shall constitute a binding Contract between us. We understand that you are not bound to accept the lowest or any Bid you receive.

We hereby confirm that this Bid complies with the Bid validity and Bid Security required by the bidding documents and specified in the Bidding Data Sheet.

Authorized Signature: _____

Name and Title of Signatory: _____

Name of Bidder: _____

VAT registration Number: _____

Address: _____

Qualification Information

1. Individual Bidders or Individual Members of Joint Ventures

1.1 Constitution or legal status of Bidder: *[attach copy]*

Place of registration: *[insert]*
Principal place of business: *[insert]*
Power of attorney of signatory of Bid: *[attach]*

1.2 The annual turnover of the last three (03) years, *[insert]*

1.3 Services performed as Service Provider on the provision of Services of a similar nature and complexity over the last three years. Also list details of work under way or committed, including expected completion date.

Lot-1			
Project name and country	Name of employer and contact person	Type of Services provided and year of completion	Value of contract
(a)			
(b) ...			

Lot-2			
Project name and country	Name of employer and contact person	Type of Services provided and year of completion	Value of contract
(a)			
(b) ...			

Lot-3			
Project name and country	Name of employer and contact person	Type of Services provided and year of completion	Value of contract
(a)			
(b) ...			

1.4 Major items of Service Provider's Equipment proposed for carrying out the Services. List all information requested below. Refer also to ITB Sub-Clause 5.5(c).

Lot-1

Item of equipment	Description, make, and age (years)	Condition (new, good, poor) and number available	Owned, leased (from whom?), or to be purchased (from whom?)
(a)			
(b)			

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Lot-2

Item of equipment	Description, make, and age (years)	Condition (new, good, poor) and number available	Owned, leased (from whom?), or to be purchased (from whom?)
(a)			
(b)			

Lot-3

Item of equipment	Description, make, and age (years)	Condition (new, good, poor) and number available	Owned, leased (from whom?), or to be purchased (from whom?)
(a)			
(b)			

1.5 Qualifications and experience of key personnel proposed for administration and execution of the Contract. Attach biographical data and valid certificates should be submitted. Refer also to ITB Sub-Clause 5.5(d) and GCC Clause 4.1.

Lot-1			
Position	Name	Years of experience (general)	Years of experience in proposed position
(a)			
(b) ...			
Lot-2			
Position	Name	Years of experience (general)	Years of experience in proposed position
(a)			
(b) ...			
Lot-3			
Position	Name	Years of experience (general)	Years of experience in proposed position
(a)			
(b) ...			

1.6 Audited Financial statements for the last three years: balance sheets, profit and loss statements, auditors' reports, etc. List below and attach copies.

1.7 Evidence of access to financial resources to meet the qualification requirements: cash in hand, lines of credit, etc. List below and attach copies of support documents.

1.8 Name, address, and telephone, telex, and facsimile numbers of banks that may provide references if contacted by the Employer.

1.9 Information regarding any litigation, current or within the last three years, in which the Bidder is or has been involved.

Lot-1

Other party(ies)	Cause of dispute	Details of litigation award	Amount involved
(a)			
(b)			

Lot-2

Other party(ies)	Cause of dispute	Details of litigation award	Amount involved
(a)			
(b)			

Lot-3

Other party(ies)	Cause of dispute	Details of litigation award	Amount involved
(a)			
(b)			

1.10 We certify/confirm that we comply with eligibility requirements as per ITB Clause 4.

1.11 Statement of compliance with the requirements of ITB Sub-Clause 4.2.

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1.12 Proposed Program (service work method and project schedule). Descriptions, drawings, and charts, as necessary, to comply with the requirements of the bidding documents.

1.13 Bidder should possess technical know-how, essential equipment and infrastructure facilities to the required level to cover the volume of services expected under the contract.

2. Joint Ventures

2.1 The information listed in 1.1 - 1.10 above shall be provided for each partner of the joint venture.

2.2 The information in 1.11 above shall be provided for the joint venture.

2.3 Attach the power of attorney of the signatory (ies) of the Bid authorizing signature of the Bid on behalf of the joint venture.

2.4 Attach the Agreement among all partners of the joint venture (and which is legally binding on all partners), which shows that

   (a) all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms;

   (b) one of the partners will be nominated as being in charge, authorized to incur liabilities, and receive instructions for and on behalf of any and all partners of the joint venture; when a foreign partner/s is/are involved one of the local partners shall be nominated as being in charge; and

   (c) the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.

3. Additional Requirements

3.1 Bidders should provide any additional information required in the BDS and to fulfill the requirements of ITB Sub-Clause 5.1, if applicable.

Letter of Acceptance

[letterhead paper of the Employer]

<div align="right">

[date]

</div>

To: *[name and address of the Service provider]*

This is to notify you that your Bid dated *[date]* for execution of the *[name of the Contract and identification number, as given in the Special Conditions of Contract]* for the Contract Price of the equivalent of *[amount in numbers and words]* as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by our agency.

You are hereby instructed to proceed with the execution of the said contract for the provision of Services in accordance with the Contract documents.

Please return the attached Contract dully signed

Authorized Signature: _____

Name and Title of Signatory: _____

Name of Agency: _____

Attachment: Contract

Form of Contract

[letterhead paper of the Employer]

LUMP-SUM REMUNERATION

This CONTRACT (hereinafter called the "Contract") is made the *[day]* day of the month of *[month]*, *[year]*, between, on the one hand, *[name of Employer]* (hereinafter called the "Employer") and, on the other hand, *[name of Service Provider]* (hereinafter called the "Service Provider").

[***Note***: *In the text below text in brackets is optional; all notes should be deleted in final text. If the Service Provider consist of more than one entity, the above should be partially amended to read as follows:* "…(hereinafter called the "Employer") and, on the other hand, a joint venture consisting of the following entities, each of which will be jointly and severally liable to the Employer for all the Service Provider's obligations under this Contract, namely, *[name of Service Provider]* and *[name of Service Provider]* (hereinafter called the "Service Provider").]

WHEREAS

    (a)   the Employer has requested the Service Provider to provide certain Services as defined in the General Conditions of Contract attached to this Contract (hereinafter called the "Services");

    (b)   the Service Provider, having represented to the Employer that they have the required professional skills, and personnel and technical resources, have agreed to provide the Services on the terms and conditions set forth in this Contract at a contract price of…………………… for a period of 36 months from the date of commissioning unless terminated earlier;

    (c)   the Employer has received the financial allocation from the Government of Democratic Socialist Republic of Sri Lanka (Hereinafter called as "GOSL") to eligible payments under this Contract.

NOW THEREFORE the parties hereto hereby agree as follows:

1.   The following documents shall be deemed to form and be read and construed as part of this Agreement, and the priority of the documents shall be as follows:

    (a)   the Letter of Acceptance;

    (b)   the Service Provider's Bid

    (c)   the Special Conditions of Contract;

    (d)   the General Conditions of Contract;

    (e)   the Specifications

    (f)   the Priced Activity Schedule

    (g)   And the following Appendices

        Appendix A: Description of the Services

        Appendix B: Schedule of Payments

        Appendix C: Key Personnel

Appendix D: Breakdown of Contract Price in Foreign Currency

Appendix E: Breakdown of Contract Price in Local Currency

Appendix F: Services and Facilities Provided by the Employer

Appendix G: Performance Incentive Compensation-Not used

Appendix H: Service Level Agreement

2.   The mutual rights and obligations of the Employer and the Service Provider shall be as set forth in the Contract, in particular:

(a)   the Service Provider shall carry out the Services in accordance with the provisions of the Contract; and

(b)   the Employer shall make payments to the Service Provider in accordance with the provisions of the Contract.

IN WITNESS WHEREOF, the Parties hereto have caused this Contract to be signed in their respective names as of the day and year first above written.

For and on behalf of *[name of Employer]*

………………………….
[Authorized Representative]   *Seal*

For and on behalf of *[name of Service Provider]*

………………………….
[Authorized Representative]   *Seal*

[***Note*:** *If the Service Provider consists of more than one entity, all these entities should appear as signatories, e.g., in the following manner*:]

For and on behalf of each of the Members of the Service Provider

[name of member]

[Authorized Representative]

[name of member]

[Authorized Representative]

Bid Security (Bank Guarantee)

[The Bank shall fill in this Bank Security (Bank Guarantee) Form in accordance with the instructions indicated.]

Beneficiary: _____

Date: _____

BID SECURITY (BANK GUARANTEE) No.: _____

We have been informed that _____ (hereinafter called "the Bidder") has submitted to you its bid dated (hereinafter called "the Bid") for the execution of _____ under Invitation for Bids No. _____ ("the IFB").

Furthermore, we understand that, according to your conditions, bids must be supported by a Bid Security (Bank Guarantee).

At the request of the Bidder, we _____ hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of _____ (_____) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

(a)   has withdrawn its Bid during the period of bid validity specified by the Bidder in the Form of Bid; or

(b)   having been notified of the acceptance of its Bid by the Employer during the period of bid validity, (i) fails or refuses to execute the Contract Form; or (ii) fails or refuses to furnish the performance security, in accordance with the Instructions to Bidders.

This guarantee will expire: (a) if the Bidder is the successful bidder, upon our receipt of copies of the contract signed by the Bidder and the performance security issued to you upon the instruction of the Bidder; or (b) if the Bidder is not the successful bidder, upon the earlier of (i) our receipt of a copy of your notification to the Bidder of the name of the successful bidder; or (ii) twenty-eight days after the expiration of the Bidder's Bid.

Consequently, any demand for payment under this guarantee must be received by us at the office by _____ (date Month year).

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No..............................

_____
[signature(s)]

Section IV. Eligible Countries

Not Applicable

Section V. Activity Schedule

The Service Provider shall establish and provide services as described in the Appendix A – Description of Services. This gives detailed information about the project background, specifications, work flow, activities, and service level requirements etc.

Section VI. General Conditions of Contract

1. General Provisions

1.1 Definitions   1.1   The following words and expressions shall have the meanings hereby assigned to them:

(a)   "Contract" means the Contract Agreement signed by the Parties, together with the Contract Documents referred to therein, including all attachments, appendices, and all documents incorporated by reference therein.

(b)   "Contract Documents" means the documents listed in the Contract Agreement, including any amendments thereto.

(c)   "Contract Price" means the price payable to the Supplier as specified in the Contract Agreement, subject to such additions and adjustments thereto or deductions there from, as may be made pursuant to the Contract.

(d)   "Day" means calendar day.

(e)   "Completion Date" means the date of completion of the Services by the Service Provider as certified by the Employer

(f)   "GCC" means the General Conditions of Contract.

(g)   "Services" means the work to be performed by the Service Provider pursuant to this Contract, as described in Appendix A; and in the Specifications and Schedule of Activities included in the Service Provider's Bid.

(h)   "Employer" means the entity who employs the Service Provider

(h)   "Subcontractor" means any natural person, private or government entity, or a combination of the above, to whom any part of the Services is subcontracted by the Supplier.

(i)   "Service Provider" means the natural person, private or government entity, or a combination of the above, whose bid to provide the Services has been accepted by the Employer and is named as such in the Contract Agreement.

(j)   "Service Provider's Bid" means the completed bidding document submitted by the Service Provider to the Employer

(l)   "SCC" means the Special Conditions of Contract by which the

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GCC may be amended or supplemented;

(m) "Specifications" means the specifications of the service included in the bidding document submitted by the Service Provider to the Employer

(n) "The Project Site," where applicable, means the place named in the SCC.

(o) "Activity Schedule" is the priced and completed list of items of Services to be performed by the Service Provider forming part of his Bid;

(p) "Member," in case the Service Provider consist of a joint venture of more than one entity, means any of these entities; "Members" means all these entities, and "Member in Charge" means the entity specified in the SSC to act on their behalf in exercising all the Service Provider' rights and obligations towards the Employer under this Contract;

(q) "Party" means the Employer or the Service Provider, as the case may be, and "Parties" means both of them;

(r) "Personnel" means persons hired by the Service Provider or by any Subcontractor as employees and assigned to the performance of the Services or any part thereof;

1.2 Applicable Law The law governing the contract shall be the laws of the Democratic Socialist Republic of Sri Lanka.

1.3 Language This Contract has been executed in the language **specified in the SCC,** which shall be the binding and controlling language for all matters relating to the meaning or interpretation of this Contract.

1.4 Notices 1.4.1 Any notice, request, or consent made pursuant to this Contract shall be in writing and shall be deemed to have been made when delivered in person to an authorized representative of the Party to whom the communication is addressed, or when sent by registered mail, email or facsimile to such Party at the address specified in the SCC.

1.4.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.

1.5 Location The Services shall be performed at such locations as are specified in Appendix A, in the specifications and, where the location of a particular task is not so specified, at such locations, whether in the Government's country or elsewhere, as the Employer may approve.

1.6 Authorized Representatives Any action required or permitted to be taken, and any document required or permitted to be executed, under this Contract by the Employer or the Service Provider may be taken or executed by the officials **specified in the SCC.**

1.7 Inspection and Audit by the GOSL	The Service Provider shall permit the GOSL to inspect its accounts and records relating to the performance of the Services under this contract and to have them audited by auditors appointed by the GOSL, if so required by the GOSL.
1.8 Taxes and Duties	The Service Provider and its Personnel shall pay such taxes, duties, fees, and other impositions as may be levied under the Applicable Law, the amount of which is deemed to have been included in the Contract Price.

2. Commencement, Completion, Modification, and Termination of Contract

2.1 Effectiveness of Contract	This Contract shall come into effect on the date the Contract is signed by both parties or such other later date as may be **stated in the SCC.**
2.2 Commencement of Services	
2.2.1 Program	Before commencement of the Services, the Service Provider shall submit to the Employer for approval a Program showing the general methods, arrangements, order and timing for all activities. The Services shall be carried out in accordance with the approved Program as updated, notified amongst the authorized representatives.
2.2.2 Starting Date	The Service Provider shall start carrying out the Services thirty (30) days after the date the Contract becomes effective, or at such other date as may be **specified in the SCC.**
2.3 Intended Completion Date	Unless terminated earlier pursuant to Sub-Clause 2.6, the Service Provider shall complete the activities by the Intended Completion Date, as is **specified in the SCC.** If the Service Provider does not complete the activities by the Intended Completion Date, it shall be liable to pay liquidated damage as per Sub-Clause 3.8. In this case, the Completion Date will be the date of completion of all activities.
2.4 Modification	Modification of the terms and conditions of this Contract, including any modification of the scope of the Services or of the Contract Price, may only be made by written agreement between the Parties.
2.5 Force Majeure	
2.5.1 Definition	For the purposes of this Contract, "Force Majeure" means an event which could not be anticipated oris beyond the reasonable control of a Party and which makes a Party's performance of its obligations under the Contract impossible or so impractical as to be considered impossible under the circumstances.

2.5.2 No Breach of Contract   The failure of a Party to fulfill any of its obligations under the contract shall not be considered to be a breach of, or default under, this Contract insofar as such inability arises from an event of Force Majeure, provided that the Party affected by such an event (a) has taken all reasonable precautions, due care and reasonable alternative measures in order to carry out the terms and conditions of this Contract, and (b) has informed the other Party as soon as possible about the occurrence of such an event.

2.5.3 Extension of Time   Any period within which a Party shall, pursuant to clause 2.4 of this Contract, complete any action or task, shall be extended for a period equal to the time during which such Party was unable to perform such action as a result of Force Majeure, provided that such period does not exceed 30 days

2.6 Termination

2.6.1 By the Employer   The Employer may terminate this Contract, by not less than fifteen (15) days' written notice of termination to the Service Provider, to be given after the occurrence of any of the events specified in paragraphs (a) through (d) of this Sub-Clause 2.6.1:

(a) if the Service Provider does not remedy a failure in the performance of its obligations under the Contract, within fifteen (15) days after being notified or within any further period as the Employer may have subsequently approved in writing;

(b) if the Service Provider becomes insolvent or bankrupt;

(c) if, as the result of Force Majeure, the Service Provider is unable to perform a material portion of the Services for a period of not less than thirty (30) days; or

(d) if the Service Provider, in the judgment of the Employer has engaged in corrupt practices, collusive practices, coercive practices, obstructive practices or fraudulent practices in competing for or in executing the Contract.

For the purposes of this Sub-Clause:

(i) "corrupt practice" is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;

(ii) "fraudulent practice" is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

(iii) "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another

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party;

(iv)   "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

(v)   "obstructive practice" is

(aa)   deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a GOSL investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or

(bb)   acts intended to materially impede the exercise of the GOSL's inspection and audit rights

2.6.2 By the Service Provider   The Service Provider may terminate this Contract, by not less than thirty (30) days' written notice to the Employer, such notice to be given after the occurrence of any of the events specified in paragraphs (a) and (b) of this Sub-Clause 2.6.2:

(a)   if the Employer fails to pay any monies due to the Service Provider pursuant to this Contract and not subject to dispute pursuant to Clause 7 within forty-five (45) days after receiving written notice from the Service Provider that such payment is overdue; or

(b)   if, as the result of Force Majeure, the Service Provider is unable to perform a material portion of the Services for a period of not less than thirty (30) days.

2.6.3 Suspension of funds   In the event that the GOSL suspends the funds to the Employer, from which part of the payments to the Service Provider are being made:

(a)   The Employer is obligated to notify the Service Provider of such suspension within 7 days of having received the GOSL's suspension notice.

(b)   If the Service Provider has not received sums due to by the due date stated in the SCC in accordance with Sub-Clause 6.5 the Service Provider may immediately issue a 14 day termination notice.

2.6.4 Payment   Upon termination of this Contract pursuant to Sub-Clauses 2.6.1 or

upon Termination	2.6.2, the Employer shall make the following payments to the Service Provider:

(a) remuneration pursuant to Clause 6 for Services satisfactorily performed prior to the effective date of termination;

(b) except in the case of termination pursuant to paragraphs (a), (b), (d) of Sub-Clause 2.6.1, reimbursement of any reasonable cost incident to the prompt and orderly termination of the Contract, including the cost of the return travel of the Personnel.

3. Obligations of the Service Provider

3.1 General	The Service Provider shall perform the Services in accordance with the Specifications and the Activity Schedule, and carry out its obligations with all due diligence, efficiency, and economy, in accordance with generally accepted professional techniques and practices, and shall observe sound management practices, and employ appropriate advanced technology and safe methods. The Service Provider shall always act, in respect of any matter relating to this Contract or to the Services, as faithful adviser to the Employer, and shall at all times support and safeguard the Employer's legitimate interests in any dealings with third parties.
3.2 Conflict of Interests	
3.2.1 Service Provider Not to Benefit from Commissions and Discounts.	The remuneration of the Service Provider pursuant to Clause 6 shall constitute the Service Provider's sole remuneration in connection with this Contract or the Services, and the Service Provider shall not accept for their own benefit any trade commission, discount, or similar payment in connection with activities pursuant to this Contract or to the Services or in the discharge of their obligations under the Contract, and the Service Provider shall use their best efforts to ensure that the Personnel and its agents similarly shall not receive any such additional remuneration.
3.2.2 Prohibition of Conflicting Activities	Neither the Service Provider nor its Personnel shall engage, either directly or indirectly, in any of the following activities:

(a) during the term of this Contract, any business or professional activities which would conflict with the activities assigned to them under this Contract;

(b) after the termination of this Contract, such other activities as may be **specified in the SCC.**

3.3 Confidentiality	The Service Provider, and its Personnel shall not, either during the term or within two (2) years after the expiration of this Contract, disclose any proprietary or confidential information relating to the

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Project, the Services, this Contract, or the Employer's business or operations without the prior written consent of the Employer.

3.4 Insurance to be taken Out by the Service Provider	The Service Provider (a) shall take out and maintain, at its own cost but on terms and conditions approved by the Employer, insurance against the risks, and for the coverage, as shall be **specified in the SCC;** and (b) at the Employer's request, shall provide evidence to the Employer showing that such insurance has been taken out and maintained and that the current premiums have been paid.

3.5 Service Provider's Actions Requiring Employer's Prior Approval

The Service Provider shall obtain the Employer's prior approval in writing before taking any of the following actions:

(a)   appointing such members of the Personnel not listed by name in Appendix C ("Key Personnel"),

(b)   changing the Program of activities; and

(c)   any other action that may be **specified in the SCC.**

3.6 Reporting Obligations

The Service Provider shall submit to the Employer the reports and documents specified in Description of Services in the form, in the numbers, and within the periods set forth in the said Appendix.

3.7 Documents Prepared by the Service Provider to Be the Property of the Employer

All plans, drawings, specifications, designs, reports, and other documents and software submitted by the Service Provider in accordance with Sub-Clause 3.6 shall become and remain the property of the Employer, and the Service Provider shall, not later than upon termination or expiration of this Contract, deliver all such documents and software to the Employer, together with a detailed inventory thereof. The Service Provider shall not retain copies of such documents, software, licenses, data and any other form of intellectual property.

3.8 Liquidated Damages

3.8.1 Payments of Liquidated Damages

The Service Provider shall pay liquidated damages to the Employer at the rate per day **stated in the SCC** for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount **defined in the SCC.**   The Employer may deduct liquidated damages from payments due to the Service Provider. Payment of liquidated damages shall not affect the Service Provider's liabilities.

3.8.2 Correction for Over-payment

If the Intended Completion Date is extended after liquidated damages have been paid, the Employer shall correct any overpayment of liquidated damages by the Service Provider. The Service Provider shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in Sub-Clause 6.5.

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3.8.3 Lack of performance penalty

If the Service Provider has not corrected a Defect within the time specified in the Employer's notice, a penalty for Lack of performance will be paid by the Service Provider. The amount to be paid will be calculated as a percentage of the cost of having the Defect corrected, assessed as described in Sub-Clause 7.2 and **specified in the SCC.**

3.9 Performance Security

The Service Provider shall provide the Performance Security to the Employer in the format of the performance Bank Guarantee given in the bidding document no later than the date specified in the Letter of acceptance. The Performance Security shall be issued in an amount and form and by a bank acceptable to the Employer, and denominated in the types and proportions of the currencies in which the Contract Price is payable. The performance Security shall be valid until a date 28 days from the Completion Date of the Contract in case of a bank guarantee.

4. Service Provider's Personnel

4.1 Description of Personnel

The titles, agreed job descriptions, minimum qualifications, and estimated periods of engagement in the carrying out of the Services of the Service Provider's Key Personnel are described in Appendix C. The Key Personnel listed by title as well as by name in Appendix C are hereby approved by the Employer.

4.2 Removal and/or Replacement of Personnel

(a) Except as the Employer may otherwise agree, no changes shall be made in the Key Personnel. If, for any reason beyond the reasonable control of the Service Provider, it becomes necessary to replace any of the Key Personnel, the Service Provider shall provide as a replacement a person of equivalent or better qualifications and skills.

(b) If the Employer finds that any of the Personnel have (i) committed serious misconduct or have been charged with having committed a criminal action, or (ii) have reasonable cause to be dissatisfied with the performance of any of the Personnel, then the Service Provider shall, at the Employer's written request specifying the grounds thereof, provide as a replacement a person with qualifications and experience acceptable to the Employer.

(c) The Service Provider shall have no claim for additional costs arising out of or incidental to any removal and/or replacement of Personnel.

5. Obligations of the Employer

5.1 Assistance and Exemptions

The Employer shall use its best efforts to ensure that the Government shall provide the Service Provider such assistance as **specified in the SCC.**

5.2 Change in the Applicable Law

If, after the date of this Contract, there is any change in the Applicable Law with respect to taxes and duties which increases or decreases the cost of the Services rendered by the Service Provider, then the remuneration and reimbursable expenses otherwise payable to the Service Provider under this Contract shall be increased or decreased accordingly by agreement between the Parties, and corresponding adjustments shall be made.

5.3 Services and Facilities

The Employer shall make available to the Service Provider the Services and Facilities listed under Appendix F.

6. Payments to the Service Provider

6.1 Lump-Sum Remuneration

The Service Provider's remuneration shall not exceed the Contract Price and shall be a fixed lump-sum and all other costs incurred by the Service Provider in carrying out the Services described in Appendix A. Except as provided in Sub-Clause 5.2, the Contract Price may only be increased above the amounts stated in Sub-Clause 6.2 if the Parties have agreed to additional payments in accordance with Sub-Clauses 2.4 and 6.3.

6.2 Contract Price

The price is payable in Respective currencies as stated in the SCC.

6.3 Payment for Additional Services, and Performance Incentive Compensation

6.3.1 For the purpose of determining the remuneration due for additional Services as may be agreed under Sub-Clause 2.4, a breakdown of the lump-sum price is provided in Appendices D and E.

6.3.2 **If the SCC so specify,** the service provider shall be paid performance incentive compensation as set out in the Performance Incentive Compensation appendix.

6.4 Terms and Conditions of Payment

Payments will be made to the Service Provider according to the payment schedule **stated in the SCC. Unless otherwise stated in the SCC**, the advance payment (Advance for Mobilization, Materials and Supplies) shall be made against the provision by the Service Provider of a bank guarantee for the same amount, and shall be valid for the period **stated in the SCC.** Any other payment shall be made after the conditions **listed in the SCC** for such payment have been met, and the Service Provider have submitted an invoice to the Employer specifying the amount due.

6.5 Period allocated for Payments	Payments shall be made within the period specified in the **SCC**
6.6 Day works	6.6.1 If applicable, the Day work rates in the Service Provider's Bid shall be used for small additional amounts of Services only when the Employer has given written instructions in advance for additional services to be paid in that way.
	6.6.2 All work to be paid for as Day works shall be recorded by the Service Provider on forms approved by the Employer. Each completed form shall be verified and signed by the Employer representative as indicated in Sub-Clause 1.6 within two days of the Services being performed.
	6.6.3 The Service Provider shall be paid for Day works subject to obtaining signed Day works forms as indicated in Sub-Clause 6.6.2

7. Quality Control

7.1 Identifying Defects	The principle and modalities of Inspection of the Services by the Employer shall be as **indicated in the SCC.** The Employer shall check the Service Provider's performance and notify him of any Defects that are found. Such checking shall not affect the Service Provider's responsibilities. The Employer may instruct the Service Provider to search for a Defect and to uncover and test any service that the Employer considers may have a Defect. Defect Liability Period is as **defined in the SCC**.
7.2 Correction of Defects, and Lack of Performance Penalty	(a) The Employer shall give notice to the Service Provider of any Defects before the end of the Contract. The Defects liability period shall be extended for as long as Defects remain to be corrected.
	(b) Every time notice of a Defect is given, the Service Provider shall correct the notified Defect within the length of time specified by the Employer's notice or specified in the Service Level Agreement (SLA).
	(c) If the Service Provider has not corrected a Defect within the time specified in the Employer's notice, the Employer will assess the cost of having the Defect corrected, the Service Provider will pay this amount, and a Penalty for Lack of Performance calculated as as specified in Service Level Agreement (SLA).

8. Settlement of Disputes

8.1 Amicable Settlement	The Parties shall use their best efforts to settle amicably all disputes

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arising out of or in connection with this Contract or its interpretation.

**8.2 Dispute
    Settlement**

8.2.1 If any dispute arises between the

and the Service Provider in connection with, or arising out of, the Contract or the provision of the Services, whether during carrying out the Services or after their completion, the matter shall be referred to the Adjudicator within 14 days of the notification of disagreement of one party to the other.

8.2.2 The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.

8.2.3 The Adjudicator shall be paid by the hour at the rate **specified in the BDS and SCC,** together with reimbursable expenses of the types **specified in the SCC**, and the cost shall be divided equally between the Employer and the Service Provider, whatever decision is reached by the Adjudicator. Either party may refer a decision of the Adjudicator to an Arbitrator within 28 days of the Adjudicator's written decision. If neither party refers the dispute to arbitration within the above 28 days, the Adjudicator's decision will be final and binding.

8.2.4 The arbitration shall be conducted in accordance with the arbitration procedure published by the institution named and in the place **shown in the SCC.**

8.2.5 Should the Adjudicator resign or die, or should the Employer and the Service Provider agree that the Adjudicator is not functioning in accordance with the provisions of the Contract, a new Adjudicator will be appointed in terms of section 8.2.1.

Section VII. Special Conditions of Contract

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
1.1(a)	The contract name is; PROCUREMENT OF SERVICES FOR INSTALLATION, CONFIGURATION AND MAINTENANCE OF APPLICATION STACKS FOR THE LANKA GOVERNMENT CLOUD 2.0 The contract number; **ICTA/GOSL/SER/NCB/2016/26 – Lot-1: OpenStack based Cloud** **ICTA/GOSL/SER/NCB/2016/26 – Lot-2: Mesosphere** **ICTA/GOSL/SER/NCB/2016/26 – Lot-3: Hadoop Distribution**
1.1(h)	The Employer is; Information and Communication Technology Agency of Sri Lanka
1.1(j)	The Service Provider is;_____
1.1(p)	The Member in Charge is: _____
1.3	The language is English. In the event a document in a language other than English need be submitted, an official translation of the same in English need be submitted along with the document, and the content of the translated document shall only be recognized.
1.4	Notices shall be given to the Authorized Representative stated in SCC 1.6
1.5	The Services shall be performed at such location intimated by the Employer in writing.
1.6	The Authorized Representatives at the commencement of this contract are: For the Employer: For the Service Provider: The parties may amend the above on notifications in writing signed by the Chief Executive of the respective institution.
2.1	The date on which this Contract shall come into effect is; the date the contract is signed by both parties (Effective date of the contract).
2.2.2	The Starting date for the commencement of Services is; 03 days from the effective date of the contract.
2.3	Intended Completion dates for commissioning are as below; Lot-1: OpenStack based Cloud Commissioning of General Cluster of LGC 2.0 by installing, configuring and

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
	testing of OpenStack based cloud for use in forty (40) days from the date of signing the contract and intended completion date for providing support and maintenance services from the date of commissioning is 36 months.
	Lot-2: Mesosphere
	Commissioning of General Cluster of LGC 2.0 by installing, configuring and testing of Mesosphere for use in thirty (30) days from the date of signing the contract and intended completion date for providing support and maintenance services from the date of commissioning is 36 months.
	Lot-1: Hadoop Distribution
	Commissioning of Big-data Cluster of LGC 2.0 by installing, configuring and testing of Hadoop Distribution for use in forty (40) days from the date of signing the contract and intended completion date for providing support and maintenance services from the date of commissioning is 36 months.
	Employer may decide at its discretion to extend of services period beyond the 36 months period covered under this contract considering the necessity.
2.4	Parties should ensure that due process of approval be obtained prior to such modifications and be in accordance with the GOSL.
3.1	Following are additional requirements that the Service Provider shall comply.
	Upon termination and/or expiration of the contract due to the reasons as specified under GCC 2.6.1 and 2.6.2 respectively, Service Provider shall facilitate transferring of software, licenses, data and any other intellectual property ownership of which belong to the Employer from existing system to a new system designated by the Employer, within a reasonable period of time without any additional cost to the Employer.
	The Service Provider shall be required to sign an Non-Disclosure Agreement (NDA) at the time of signing the contract.
3.2.2 (b)	Neither the Service Provide nor its personnel shall not disclose information in confidential nature with regard to the architecture, design and security of the infrastructure of the employer.
3.4	The risks and coverage by insurance shall be:
	(a) Third Party motor vehicle liability insurance in respect of motor vehicles operated in Sri Lanka by the Service provider or its Personnel or any Sub-Contractors or their Personnel; with a minimum coverage of LKR 1,000,000. This refers only to motor vehicles operated by the above parties for the purpose of the contract.
	(b) Third Party liability insurance, with a minimum coverage of 10% of the contract value.

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
	(c) Professional liability insurance, with a minimum coverage to 110% of the contract value. (d) employer's liability and workers' compensation insurance in respect of the Personnel of the service provider and of any Sub-Contractor, in accordance with the relevant provisions of the Applicable Law, as well as, with respect to such Personnel, any such life, health, accident, travel or other insurance as may be appropriate; and (e) insurance against loss of or damage to (i) equipment purchased in whole or in part with funds provided under this contract, (ii) the service provider's property used in the performance of the Services, and (iii) any documents prepared by the service provider in the performance of the Services. (f) All risk Insurance coverage (war, riots, civil commotion) including fire, floods, lightning and burglary with a minimum coverage to 110% of the contract value.
3.8.1	The liquidated damages is applicable for delays beyond the last date specified for commissioning of services for use at the rate of 1 percent (1%) per day. The maximum amount of liquidated damages for the whole contract is Ten percent (10%) of the total Contract Price.
3.8.3	In the event of any defective performance from the Service Provider or failure to furnish the agreed level of service, the Service provider will make reasonable efforts to restore the service to the required operating condition on an urgent basis. A penalty as stipulated in the Service Level Agreement (SLA) will be imposed in the case of defective performance or failure to provide the agreed level of service to resolve the issue.
5.1	The assistance and exemptions provided to the Service Provider are: None
6.2	Contract price in Sri Lankan Rupees; Lot-1: OpenStack based Cloud - Lot-2: Mesosphere - Lot-3: Hadoop Distribution - Contract price in US Dollar; Lot-1: OpenStack based Cloud - Lot-2: Mesosphere - Lot-3: Hadoop Distribution -

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
6.3.2	The performance incentive paid to the Service Provider shall be: Not applicable
6.4	Payments shall be made according to the schedule given in Appendix B – Schedule of Payments.
6.5	Payment shall be made within 60 days of receipt of the invoice and the relevant documents specified in Sub-Clause 6.4, and within 90 days in the case of the final payment. (refer Appendix B)
7.1	The principle and modalities of inspection of the Services by the Employer are as follows: Refer Appendix A – Description of Services
7.2	The Employer reserves the rights to encash the performance security for the lack of performance
8.2.1	The Adjudicator will be appointed in agreement with both Employer and the Service Provider. If any disagreement arises in appointing an Adjudicator, both Employer and the Service Provider shall agree to have the university of Moratuwa to appoint an Adjudicator on behalf of both Employer and the Service Provider.
8.2.3	The hourly rate payable to the Adjudicator shall be Sri Lankan Rupees Fifteen thousand (LKR 15,000)
8.2.4	Arbitration shall be heard in Sri Lanka in accordance with the Arbitration Act of Sri Lanka.

Section VIII. Performance Specifications and Drawings

Refer Appendix A – Description of Services

Section IX. Contract Forms

Table of Forms

Performance Bank Guarantee (Unconditional)

Performance Bank Guarantee (Unconditional)

To: _____

Whereas _____ (hereinafter called "the Service Provider") has undertaken, in pursuance of Contract No. _____ dated _____ to execute _____ (hereinafter called "the Contract");

And whereas it has been stipulated by you in the said Contract that the Service Provider shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

And whereas we have agreed to give the Service Provider such a Bank Guarantee;

Now therefore we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Service Provider, up to a total of _____, _____, such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Service Provider before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Services to be performed there under or of any of the Contract documents which may be made between you and the Service Provider shall in any way release us from any liability under this Guarantee, and we hereby waive notice of any such change, addition, or modification.

This Guarantee shall be valid until a date 28 days from the date of issue of the Certificate of Completion.

Signature and seal of the Guarantor _____

Name of Bank _____
Address _____
Date _____

Advanced Payment Bank Guarantee

_____ *[Bank's Name, and Address of Issuing Branch or Office]*

Beneficiary: _____ *[Name and Address of Client]*

Date: _____

ADVANCE PAYMENT GUARANTEE No.: _____

We have been informed that *[name of Service Provider]* (hereinafter called "the Service Provider") has entered into Contract No. *[reference number of the contract]* dated *[insert date]* with you, for the provision of *[brief description of Services]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum of *[amount in figures]* (*[amount in words]*) is to be made against an advance payment guarantee.

At the request of the Service Provider, we *[name of Bank]* hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *[amount in figures]* (*[amount in words]*)[1] upon receipt by us of your first demand in writing accompanied by a written statement stating that the Service Provider is in breach of their obligation under the Contract because the Service Provider has used the advance payment for purposes other than toward providing the Services under the Contract.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Service Provider on their account number _____ at *[name and address of Bank]*.

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[1]

The Guarantor shall insert an amount representing the amount of the advance payment and denominated either in the currency(ies) of the advance payment as specified in the Contract, or in a freely convertible currency acceptable to the Client.

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Service Provider as indicated in copies of certified monthly statements which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of the monthly payment certificate indicating that the Consultants have made full repayment of the amount of the advance payment, or on the __ day of _____, ___,[2] whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

_____

[signature(s)]

Note: All italicized text is for indicative purposes only to assist in preparing this form and shall be deleted from the final product.

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[2] Insert the expected expiration date. In the event of an extension of the time for completion of the Contract, the Client would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Client might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the Client's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

Appendix A – Description of Services – Lot-1

Procurement of Service Provider for Installation, Configuration and Maintenance of OpenStack Based Cloud for Lanka Government Cloud 2.0

1. Introduction

Aligned with the national policy of 'Digitization of Economy', ICTA intends to implement several initiatives across the government to increase the efficiency of the government processes and to provide government services effectively and efficiently. In this context, development and improvement of digital infrastructure has been identified as a key area.

Accordingly, ICTA intends to implement an industry standard cloud environment to serve as the 'Lanka Government Cloud 2.0' (LGC 2.0) to provide efficient, cost effective, reliable and secure infrastructure services. When the current technology enhancements and trends are considered, a fully-fledged cloud environment has become an essential need and to serve to the emerging needs of the government.

The LGC 2.0 will be the central and common government cloud, and it is expected that all types of government applications will be hosted in LGC 2.0. This approach will minimize or eliminate purchasing and maintaining of servers and/or data centers by government organizations which could be time consuming, ineffective, and insecure. The objective is to eliminate all constraints and limitations to the government organizations for adopting to cloud computing strategy and thereby increase ICT usage to enhance the effectiveness and efficiency of government processes. Moreover, LGC 2.0 will support hybrid cloud model to obtain vast amount of public cloud services.

LGC 2.0 will be comprising a General Cluster which will be providing general cloud services and a Big-data Cluster which will be serving as the national data platform. ICTA has already published the tender documents for selection of service providers for obtaining bare-metal server facilities as a service for implementing the General Cluster and Big-data Cluster of LGC 2.0.

ICTA now intends to hire a qualified service provider for obtaining the services for Installation, Configuration and Maintenance of OpenStack Based Cloud for Lanka Government Cloud 2.0.

2. Concise Statement of Objectives

Carry out the initial Installation, Configuration and Commissioning of the General Cluster of LGC 2.0 on top of the bare-metal server facilities, and provide the Support and Maintenance services for a period of thirty six (36) months after commissioning.

3. Scope of Services

a) Understanding the requirements and scope and prepare the deployment architectures;
- The service provider should work collaboratively with the team appointed by ICTA to finalize the requirements and the scope of services.
- The deployment architecture should be documented and presented accordingly. The proposed architecture will be reviewed and ratified by a panel appointed by ICTA. The service provider will have to made necessary changes and improvements as recommended by the panel.
- Comprehensive documentations covering the proposed architecture and the standard operating procedures for the deployment should be prepared by the Service Provider.

b) Installation, configuring and commissioning of OpenStack Cloud;
- The service provider should install, configure, test and commission the OpenStack cloud on the given infrastructure. (refer Table-01 - hardware stack). The latest stable version of the software stack to be used.
- Cloud Management Platform (CMP) should be provided, and CMP should be able to cover below key areas (but not limited to);
  - present, purchase, provision, monitor and manage cloud resources.
  - provide a centralized, transparent and uniform billing and invoicing of the consumed services. (refer CMP section in Compliance sheet, Table-03)
- Ensure the compliance with security, data protection and audit requirements (refer Section 3.7)
- The deployment architecture and deployment should be in compliance with the best practices, applicable industry standards and guidelines issued by distributor.
- Service provider should configure Firewall/Switches and other related devices accordingly.
- The service provider should facilitate the User Acceptance Testing/ Integration Testing activities.

c) Trainings;
- The service provider should provide necessary trainings and knowledge transfer to the team as decided by ICTA.

d) Operations, support and maintenance;
- The service provider should ensure necessary infrastructure uptime and other SLAs (refer the Section-6.)
- All the required updates/upgrades, patches and security fixes released by the distributors should be deployed in a timely manner.
- Continuous performance tuning of the deployed environment should be carried out.
- Further enhancements have to be supported as and when required.

e) 24x7 industry standard help-desk support.

3.1 Hardware Stack

Required Bare-metal servers will be provided separately. Technical Specification of the hardware are given below Table-01.

#	Items	Details	Quantity
1	Server Type I	(OS/Ceph Controllers) - 2 x Intel® Xeon® Processor E5-2600 v4 product family with QPI up to 9.6 GT/s - Up to16 cores, minimum 35MB/2.1 GHz cache/processor DDR4 RDIMM slots - 256GB RAM - 2 x 3.5" / 2.5" 450GB (RAID1), 15k SAS Hot pluggable Hard Disks. - RAID 0, 1, 5, 10 Support - Network Interfaces - Minimum Dual-port 10GbE SFP+ VxLAN offload and PXE support, - 4 x 1Gbps NICs - IPMIv2 Interface. - 5 x Servers with Minimum Dual-port 16Gbps FC HBAs (Fabric Interface) + additional Dual-port 10GbE SFP+ VxLAN offload and PXE support, - Dual redundant power supplies. - All the hard disks and power supplies hot-swappable. - Support Hypervisors - Citrix® XenServer® VMware vSphere® ESXi, KVM, QEMU	6
2	Server Type II	(Storage) - 2 x Intel® Xeon® Processor E5-2600 v4 product family with QPI up to 9.6 GT/s - Up to16 cores, minimum 35MB/2.1 GHz cache/processor - DDR4 RDIMM slots - 128GB RAM - 2 x 450GB (RAID1), 15k SAS + 2 x 400GB SSD + 10 x 4TB NL-SAS/SATA. - RAID 0, 1, 5, 10 Support - Network Interfaces - Minimum 2 x Dual-port 10GbE SFP+ VxLAN offload and PXE support, - 4 x 1Gbps NICs - IPMIv2 Interface. - Dual redundant power supplies. - All the hard disks and power supplies hot-swappable. Support Hypervisors - Citrix® XenServer® VMware vSphere® ESXi, KVM, QEMU	12
3	Server Type III	(Computes) - 2 x Intel® Xeon® Processor E5-2600 v4 product family with QPI up to 9.6 GT/s - Up to16 cores, minimum 35MB/2.1 GHz cache/processor - DDR4 RDIMM slots - 384GB per server. - 16 x Servers with 2 x 3.5" / 2.5" 450GB(RAID1), 15k Hot-pluggable SAS - RAID 0, 1, 5, 10 Support - Network Interfaces - Minimum 2 x dual-port 10Gbase-T or dual-port 10GbE SFP+ VxLAN offload and PXE support,	16

		- 4 x 1Gbps NICs - IPMIv2 Interface. - Fabric Interface – Minimum dual-port 16Gbps FC HBAs - Dual redundant power supplies. - All the hard disks and power supplies hot-swappable. - Support Hypervisors - Citrix® XenServer® VMware vSphere® ESXi, KVM, QEMU	
4	Storage Array and SAN with SSD	Dual Active-Active Storage Controllers and upgraded to the latest firmware level 16 Gb FC Ports or higher on each controller. 10/100Gbps FCoE/ iSCSI Host Ports or higher on each controller FC, FCoE, iSCSI Support within the same array Dual 6Gbps SAS Buses /FC-ALs Automatic disk rebuild and Automatic disk failover Minimum 16GB Cache on Each Storage Controller or higher. Cache Upgradability 48GB or higher Ability to use Flash/SSD to improve the cache. Supported RAID Levels 0/1/5/6 Minimum 40TB effective capacity (On RAID5) Support upto 145TB effective capacity (RAID5) Support SAS, NL-SAS, Solid State/Flash Drives. Up to 1024 Maximum hosts supported Maximum LUN size should support 128TB Number of LUN 2048 or more Ability to take snapshots / Clones Data Replication supported Scalability Support Openstack API	01
5	SAN Switches	16Gbps, configured with full redundancy. <u>Special Notes</u> All servers connected to SAN with redundancy.	
6	Firewalls	High Availability Redundancy Application Filtering (Layer 7 application and Layer 8 (user-identity) control and visibility) - NextGen Firewall features Stateful inspection – Anti-Virus, Anti-Spam, Anti-Spyware, Web Filtering, Bandwidth Management, Multiple Link Management, User-Identity, Source & Destination Zone, MAC and IP address, Service QoS Gateway AntiVirus, AntiSpam, Anti-Spyware Logging & Reporting Intrusion Prevention System (IPS) Surfing user/group quota policies IPv6 Support Up to Firewall Throughput (UDP) (Mbps) 160,000 Up to Firewall Throughput (TCP) (Mbps) 70,000 Up to IPSec VPN Throughput (Mbps) 10,000 Up to 9,500 No. of IPSecTunnels Up to SSL VPN Throughput (Mbps) 1,450 Configurable Internal/DMZ/WAN Ports Port Options for Ports Module (GbE Copper / GbE Fiber / 10GbE Fiber)	2

#			
		Up to Fully Protected Throughput (Mbps) 8,250	
7	Rack Switches (for Rack 1 & 2)	L2, L3 Support Full IPv6 Support in Hardware Redundancy within the Rack. (Minimum 2 x ToR) Support for OpenFlow 1.3 ToR switches to be stacked and servers connected with multi-chassis LAG support. 4096 VLANs, ACL's, Spanning tree and IEEE standards / protocols support Multicast, IGMP support. Switch management - SNMP v2 Support, CLI-based management console, SSH v2 Support, Software Backup/Restore method Ethernet Ports - 10Gbps ports for servers, 40 Gbps uplinks to Aggregation/Core. switches. ToR switches connected via Aggregation/Core redundant switch cluster	
8	Management Switches.	- L2, L3 Support. - Full IPv6 Support in Hardware - 4096 VLANs, ACL's, Spanning tree and IEEE standards / protocols support - Ports: 1Gbps RJ-45 - At least 2 x 1Gbps + IPMI interfaces connected. - Rack interconnectivity can be via the Aggregation/Core switches.	
9	Rack	42U Rack with USB KVM Switches with LCD monitor. Power panels and connectors support dual source and power panels includes power meters.	

Table 01: Hardware Stack

Initially, 34 servers to be allocated for OpenStack based cloud (16 computes nodes, 12 storage nodes and 6 servers for controllers/management purpose).

If the mainstream distribution to be used for deployment, it has to be specified.

3.2 Cloud Virtualization Layer

A Hypervisor is virtualization software that is responsible for the lifecycle management of virtual machines. Key functionality compliance sheet is given in below Table-02.

(Failure to complete the compliance sheet may reject the bid)

#	Functionality	Compliance (Yes/No) * Please indicate 'Yes' or 'No' only	Alternative/Remarks * Mandatory if the compliance is 'No'	Page Reference no.
1	Hypervisor shall have the capability to create new templates, clone templates from existing VMs to provision VMs.			
2	Hypervisor should have the ability to configure thin and			

#		Compliance (Yes/No)	Alternative/ Remarks	Page Reference no.
	thick provision disks.			
3	Hypervisor should support live VM migration			
4	Hypervisor shall have High Availability capabilities for the VMs.			
5	Support configurations of IEEE 802.1q VLANs.			
6	Hypervisor should conform to Open standards			
7	Hypervisor should support OpenStack cloud platform			
8	Support Ceph RADOS			

Table 02: Compliance of Cloud Virtualization Layer

3.3 Openstack based Cloud Platform (Distribution) and Cloud Management Platform (CMP) and other Key functionality/Capabilities

(Failure to complete the compliance sheet may reject the bid)

#	Functionality	Compliance (Yes/No) * Please indicate 'Yes' or 'No' only	Alternative/ Remarks * Mandatory if the compliance is 'No'	Page Reference no.
	Openstack based Cloud Platform(Distribution)			
1	supports the entire stack: Host OS, Hypervisor, OpenStack, and Ceph storage and Cloud Management Platform(CMP)			
2	Certified Security certification of Common Criteria (ISO/IEC 15408), FIPS or equivalent.			
3	Should be supported at least lifecycle of 5 years			
4	At least one of the Linux guest flavor which is supported through the lifecycle of 5 Yrs (specify)			
5	Platform Should Certified with multiple Industry leading Storage Solutions (eg-: Ceph , NetApp , EMC , Veritas, HP 3PAR etc.)			
6	Should be included toolset which help in Installation, Configuration, Re-configuration, Version management, In place upgrade / update etc.			
7	Should be supported Instance high-availability by configuring compute nodes.			
8	Should be supported Controller nodes high-availability and load balancing			
9	Supports Automatic Patch Notification & Security Alerts			
10	Supports Automatic Updates (Minor Releases) and Automatic Upgrades (Major Releases)			
11	Co-Engineered with underlying Linux distribution			

	Cloud Management Platform(CMP)			
1	Provide automation for the 'end to end' provisioning of a virtual server with required OS.			
2	Support Management of the entire Cloud / Virtualization infrastructure, including VMs, Hypervisors, Hosts/Clusters and Storage			
3	Support Management of multiple Virtualization Hypervisors (KVM, VMWare, Hyper-V etc.), Private Cloud Platforms (OpenStack) and 3rd Party Public Cloud Platforms (AWS, Azure, Rackspace...)			
4	Support Container based environments like Docker /Kubernets / OpenShift etc.			
5	Provides essential management capabilities necessary for real-time, policy-based adaptive management and automation.			
6	Support Virtual Machine (VM) Life Cycle Management, Resource Management, Optimization, and Capacity Planning with a Choice of Self Service Portal.			
7	Support Delegated Administration and Distributed Operations			
8	Ability to define roles and limit management scope based on location, function, application, zone, life cycle, VM content, and any user defined criteria. Control role-based, self-service provisioning of VMs by assigning tags and retirements dates.			
9	Ability to define taxonomy and arbitrary classifications, enabling business-specific tagging to be used for automated access control.			
10	Support for roles and delegated administration over multiple data centers, multiple management systems (e.g., virtual centers).			
11	Ability to Collect and Process Capacity and Utilization data into charts to identify bottlenecks and view usage trends for VMs, hosts, clusters, and datastores. Show tightly integrated, powerful timelines to understand what activities are taking place for a given time period for management systems, hosts, clusters, and Vms.			
12	Support Forensic analysis using Smart State data to Analyze virtual machine instances			
13	Support Continuous Discovery, Tracking, and Analysis of Cloud / Virtual infrastructure			
14	Support Effective configuration management of virtual infrastructures for Reliability, Security, and Availability.			
15	Support Policy-based management of virtual infrastructures includes settings, patches, services, firewalls, networks, VLANS, port groups, data store, and host placement of VMs, as well as identification and			

	removal of orphan Vms.			
16	Support Host comparison and Drift Analysis to compare configurations of multiple hosts or compare a host or cluster to itself at different points in time.			
17	Support Alerts triggered based on Non-Compliance, Changes, Events, Host Log Messages, Performance Thresholds, Workload Changes etc			
18	Support Visualization capabilities like Reports, Analytics, Change Alerts, and Virtual Time Lines to enable the quick identification and context of performance and availability problems.			
19	Support Federated Management across the virtual infrastructure including Monitoring and Operations activities that can be performed across shared sessions.			
20	Support Tracking of Capacity and utilization for Hosts, Clusters, and Data Stores, enabling alerting, reporting, and executive dashboards with views of capacity, CPU usage, memory usage, disk I/O, network I/O, CPU ready states, number of running VMs, number of running hosts, used space, and used space by file type including disk, snapshot, and memory.			
21	Support Predictive Analytics and Resource Planning			
22	Support Time line and Event tracking for help in Root Cause Analysis			
23	Support identification of Current and future bottleneck, helps optimize hosts and clusters, projecting your future needs, and showing where resources are under-allocated or over-allocated.			
24	Support checking of Security and Configuration Policies automatically during VM Provisioning while the VM is still offline with no requirements for any agent or update to the VM.			
25	Support Configuration Policies to Enforce operating system requirements, Check Versions, and verify the existence of key services.			
26	Support Resource allocation policies to ensure that VMs are correctly configured and optimized for CPU, memory, and storage, and are properly placed in the virtual infrastructure.			
27	Support Security and compliance policies to check for patches and security configurations, including firewall, network, and account access.			
28	Support VM life cycle policies to manage VM provisioning, operations, and retirement throughout the virtual infrastructure by role and job function.			
29	Support Advanced Capacity Planning, Trending and Best-fit VM placement — Factors in Resource Availability, Policies, and Business Classifications across			

	time periods optimizing planning and VM placement.			
30	Support Extensive reporting capabilities that allow usage data to be presented in a variety of formats appropriate to the recipient			
31	Support for any combination of fixed cost (allocation-based, and usage-based charge back allows flexible charge back models to be implemented) refer "Billing and Invoicing" section below.			
32	Quota management functionality allowing to define and control the cloud customers (Ex- Gov. organizations) allocated budget and preventing the quota from being exceeded (i.e.,further resources provisioning) if the allocated budget limit is reached.			
33	Support for integrate Apache Mesos endpoints			
Network Option:				
1	An SDN Controllers should be support OpenFlow 1.3 or higher.			
2	It must be possible to dynamically create policy-based virtual networks to meet a range of requirements. These virtual networks must abstract and pool network resources in a manner similar to how server virtualization abstracts and pools compute resources.			
3	An SDN controller should be able to support a minimum of 50 switches. It must also be able to mitigate the impact of network broadcast overhead and the proliferation of flow table entries.			
4	Pre-populate the flow tables to the degree possible and it must have processing and I/O capabilities that ensure that the controller is not a bottleneck in the creation of flow entries			
5	Possible to apply sophisticated filters to packets. The SDN controller should provide templates that enable the creation of scriptable CLIs that allow for the dynamic programming of the network.			
6	Possible to have multiple network paths from origin to destination. The SDN controller should also be built using both hardware and software redundancy features and it must be possible to cluster the controllers.			
7	Possible to apply enterprise class authentication and authorization and to completely isolate each virtual network. The SDN controller must be able to rate limit the control communications and should be support security applications such as DDoS protection.			
8	An SDN controller should enable the IT organization to choose the classes of traffic that it monitors and it should present to the IT organization a visualization of both the physical network and the multiple virtual networks that run on top of it.			

	Backup and Restoration			
	Regular backup of the resources (File level backup / VM level backup) must be in place. Backup frequency and retention period should be able to customize. (.) Solution Should provide facility to customize backup policy based on the tenancy			
	Storage Option			
1	Storage Backend should be Ceph or equivalent. (refer section 3.5 for further details)			
2	Should be used as the storage back-end for Nova, Cinder and Glance. etc.			
3	APIs for programmatic access			
4	Integrated with Openstack			
5	On line scalability of nodes or capacity			
6	Highly redundant and designed to have no single points of failure			
7	Solution should be self managing and self healing			
8	Support heterogeneous hardware			
9	Continuously monitors data utilization and re-balances data placement			
	Billing and Invoicing			
1	Comprehensive dash-board			
2	Ability to provide options for billing (allocation based, usage-based etc.)			
3	Ability to generate the invoices for service usage (monthly basis as a batch process, for a specified period, ad-hoc), preferably with pdf option.			
4	Facilities for provisioning of customized services (Ex: adding, discounts)			
5	Facility of updating/ tracing the payments against the invoices			
	Service Catalogue			
1	List and describe the characteristics of each selectable cloud resource (i.e., IaaS/PaaS services) as well as the list of the available complementary services			
2	Cloud resources description shall include the sizing parameters (vCPU, RAM, storage), the deployable mode, the available security level, the guaranteed SLA (e.g., availability) and the price.			
3	Resources' prices shall be differentiated depending on the resource usage term, e.g. indicating the hourly pricing (pay-per-use) or the monthly/yearly pricing (subscription) and depending on the location (Ex- which host VM reside)			
4	Service catalogue shall also allow to search, filter, select,			

	configure and order specific resources. Depending on the type of service, ordering and provisioning shall be supported by an automated, self-provisioning functionality directly interfaced with the selected cloud provider.			
5	Possibility to suspend or de-provision purchased resources or services			

Table 03: Compliance Sheet

3.4 Compute Options

Initially 16 servers (Type III) to be assigned for compute nodes. (refer Table-01)

3.5 Storage Options

Ceph for storage back-end is preferred. Ceph Storage is a scale-out, distributed, software-defined storage system. Ceph Storage should be used as the storage back-end for Nova, Cinder and Glance. Ceph Storage is used as block storage. Storage nodes run the Ceph Storage software. Compute and Controller nodes run Ceph Storage block client.

Ceph Storage option provides object storage for OpenStack VM and for clients external to OpenStack.

40TB SSD SAN and 12 servers (Type II) are available. Each server (Type II) has 40TB NL-SAS/SATA disks for data and 2 x 450GB (RAID 1) for OS, 2 x 400GB SSD for journals. For further details, refer Hardware Stack Table-01.

3.6 Infrastructure Monitoring, Reporting and Alerts

Centralized monitoring is essential for of all mission-critical components including applications, services, operating systems, network protocols, systems metrics, and network infrastructure. Proposed solution basically should monitor entire IT infrastructure and should detect security breaches, alert problem before they occur, and should alert immediately when problems arise.

3.7 Data Privacy, Security and Data Protection

Data privacy:
Service provider should be responsible for all aspects of data privacy.

Data Security Standards:
Need to follow best security practices and ensure safe and sound confidentiality and availability.

Data Protection:
Service provider will be compliant with the following specific data protection principles;
- Respect of data subjects' rights
- Respect of data quality principles
- Requirements with regard to any data transfers outside
- Audits
- Back-ups, logs and audit trails

- Personal data breaches
- Market positioning as an economic operator
- Data portability

3.8 Data Disclosure

Service provider should not disclose any data or information originating from the LGC 2.0 and institutions and transferred in execution of the the services, actively or passively, intentionally or negligently, to any authorities, legal or natural persons. A Non-Disclosure Agreement (NDA) to be signed.

3.9 Core-Location and Connectivity

The bare-metal servers co-located and ready for installations will be provided separately with physical access to the environment.

4. Schedule of Deliverable

No	Task:	Deadline:
1	- Deployment Architecture document	Effective Date (ED) + 7 days
2	- Completed environment with installations, Configurations and testing - Drafts versions of other documentations	ED + 30 days
3	- UAT and commissioning - Final documentations	ED + 40 days

5. Team Composition

#	Title	Minimum no of resources	Engagement Model	Experience
1	Project Manager/ Account Manager	1	Part-time	8+ years of relevant IT experience Minimum 2 years of Project Management Experience in Managing Cloud projects
2	Cloud Architect	1	Part-time	At least 10 years' experience in large-scale, multi-platform networks; advanced knowledge of Linux ; significant experience designing, Installing and administrating virtualized environments.

				Experience working with public cloud providers; Top cloud certification programs or similar: Excellent Communication Skill
3	Senior System Engineer (Cloud)	1	Full-time and on-site (during initial installation/ configuration/testing stage up-to commissioning	Specific virtualization certification for leading virtualization vendors. Excellent knowledge of leading operating systems technologies (e.g.: linux,) At least 6 years of implementation experience with highly virtualized shared infrastructure, platforms or applications architecture at a large enterprise or service provider. Good Communication skill
		1	Part-time (should be available on-site within 20 minutes for any critical incident during the maintenance period)	
4	Senior Software Engineer (Cloud)	1	Full-time and on-site (during initial installation/ configuration/testing stage up-to commissioning	Proven experience in deploying software to cloud computing infrastructure; Experience in SOA technologies. Experience in software development; work experience with system Configuration and deployment automation technologies. Good Communication skill
		1	Part-time (should be available on-site within 20 minutes for any critical incident during the maintenance period)	
5	Cloud Security Specialist	1	Part-time	Extensive experience and practical understanding of systems architecture, Design and delivery, large-scale enterprise applications

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				and multitenant technologies.
				Previous experience in the development and implementation of security policy frameworks specifically around standards, processes and procedures
				Experience dealing with security and risk within a ISP environment is preferred

6. Service Level Agreement and Penalty Schema

Response time

Critical	Less-Critical	Non- Critical
Cloud services not working Operations have been severely disrupted.	Operations can continue in a restricted manner and a temporary workaround is available. Critical system alerts/ warnings	Applicable to non-mission critical services System alerts/ warnings
20 Minutes	45 Minutes	60 Minutes

Resolution time and penalties

Critical	Less-Critical	Non- Critical
1 Hour	2 Hours	4 Hours
LKR 20,000 per hour	LKR 10,000 per hour	LKR 5,000 per hour

Appendix A – Description of Services – Lot-2

Procurement of Provider for Installation, Configuration and Maintenance of Mesosphere   for Lanka Government Cloud 2.0

1. Introduction

Aligned with the national policy of 'Digitization of Economy', ICTA intends to implement several initiatives across the government to increase the efficiency of the government processes and to provide government services effectively and efficiently. In this context, development and improvement of digital infrastructure has been identified as a key area.

Accordingly, ICTA intends to implement an industry standard cloud environment to serve as the 'Lanka Government Cloud 2.0' (LGC 2.0) to provide efficient, cost effective, reliable and secure infrastructure services. When the current technology enhancements and trends are considered, a fully-fledged cloud environment has become an essential need and to serve to the emerging needs of the government.

The LGC 2.0 will be the central and common government cloud, and it is expected that all types of government applications will be hosted in LGC 2.0. This approach will minimize or eliminate purchasing and maintaining of servers and/or data centers by government organizations which could be time consuming, ineffective, and insecure. The objective is to eliminate all constraints and limitations to the government organizations for adopting to cloud computing strategy and thereby increase ICT usage to enhance the effectiveness and efficiency of government processes. Moreover, LGC 2.0 will support hybrid cloud model to obtain vast amount of public cloud services.

LGC 2.0 will be comprising a General Cluster which will be providing general cloud services and a Big-data Cluster which will be serving as the national data platform. ICTA has already published the tender documents for selection of service providers for obtaining bare-metal server facilities as a service for implementing the General Cluster and Big-data Cluster of LGC 2.0.

In this approach, services for installation, configuration and maintenance of necessary software stacks will be obtained separately. ICTA now intends to hire a qualified service provider for obtaining the services for Installation, Configuration and Maintenance of Mesosphere DC/OS (Datacenter Operating System) for Lanka Government Cloud 2.0.

2. Concise Statement of Objectives

Carry out the initial Installation, Configuration and Commissioning of Mesosphere of LGC 2.0 on top of the server facilities, and provide the Support and Maintenance services (ICTA will provide license and support subscriptions from Mesosphere Inc.) for a period of thirty six (36) months after commissioning.

3. Scope of Services

a) **Understanding the requirements and scope and prepare the deployment architectures.**

- The service provider should work collaboratively with the team appointed by ICTA to finalize the requirements and the scope of services.
- Indicative High Level Reference Architecture given in figure 01.
- The deployment architecture should be documented and presented accordingly. The proposed architecture will be reviewed and ratified by a panel appointed by ICTA. The service provider will have to made necessary changes and improvements as recommended by the panel.
- Comprehensive documentations covering the proposed architecture and standard operating procedures for the deployment should be prepared by the service provider.

b) **Installation, configuring and commissioning of Mesosphere Cluster.**
- The service provider should install, configure, test and commission the Mesosphre cluster on the given infrastructure. (refer Table-01 – hardware stack). ICTA Provide Mesosphere Enterprise DC/OS License and support) Latest stable version of the software stack to be used. Enterprise DC/OS high-level architecture given in figure 02.
- Ensure the compliance with security, data protection and audit requirements (refer section 3.4)
- The deployment architecture and deployment should be in compliance with the best practices, applicable industry standards and guidelines issued by distributor and refer functionality/capability compliance sheet on section 3.2 in Table 02
- The service provider should facilitate the User Acceptance Testing/ Integration Testing activities.

c) **Trainings.**
- The service provider should provide necessary trainings and knowledge transfer to the team as decided by ICTA.

d) **Operations, support and maintenance;**

- The service provider should ensure necessary infrastructure uptime and other SLAs (refer the Section-6.)
- All the required updates/upgrades, patches and security fixes released by the distributors should be deployed in a timely manner. Continuous performance tuning of the deployed environment should be carried out.
- Further enhancements have to be supported as and when required.

e) **24x7 industry standard help-desk support.**

3.1 Hardware Stack

Required Bare-metal servers will be provided separately. Technical Specification of the hardware are given below Table-01. Initially, 15 bare-metal servers to be allocated for mesosphere.

Items	Details	Items
Server Type I	(Mesosphere) - 2 x Intel® Xeon® Processor E5-2600 v4 product family with QPI up to 9.6 GT/s - Up to16 cores, minimum 35MB/2.1 GHz cache/processor DDR4 RDIMM slots - 256GB RAM - 2 x 3.5" / 2.5" 450GB(RAID1), 15k SAS + 12 x 2 TB NL-SAS/SATA Hot pluggable Hard Disks. - RAID 0, 1, 5, 10 Support - Network Interfaces - Minimum Dual-port 10GbE SFP+ VxLAN offload and PXE support, - 4 x 1Gbps NICs - IPMIv2 Interface. - Dual redundant power supplies. - All the hard disks and power supplies hot-swappable. -	15

Table 01: Hardware Stack

3.2 Key functionality/Capability compliance sheet given in below Table 02, (failure to complete the compliance sheet will reject the bid)

#	Item	Compliance (Yes/No) * Please indicate 'Yes' or 'No' only	Alternative/ Remarks * Mandatory if the compliance is 'No'	Page Reference no.
1	Service provider should be able to deploy DC/OS on given bare-metal and virtual servers(KVM, Xen, ESXi)			
2	Service provider should deploy Docker and Mesos containers with Marathon			
3	Container orchestrator should be production proven.			
4	Should be able to deploy, operate and upgrade complex distributed services such as Hadoop,Spark, Kafka and Cassandra ,..etc with a single command			
5	Mesosphere infrastructure should be self healing (Automatic failure detection and recovery, and non-disruptive upgrades.)			
6	Should be able to integrate with LDAP for authentication and authorization			
7	Should be provide role-based access control and user auditing			
8	Should be deploy stateful apps with persistence and external volumes			

9	Service discovery and health monitoring			
10	Enterprise monitoring and Troubleshooting			
11	Capable of emergency patching			
12	Build containerized(Dockerized) CI/CD(eg- jenkin) pipeline			
13	Build code to container lifecycle -: Deploy • Repository management(eg – GitLab) • Continuous integration (eg- Jenkins) • Mesos Kernal • Internal Docker Registry • Scheduler (Marathon) • Proxy/Loadbalancer (eg- Bamboo/Haproxy)			
14	System should support multi-tenancy.			
15	Supports resource scheduling in various ways by configuring Quota, Constraint, and Role			
16	Supports various Mesos-based open source packages			

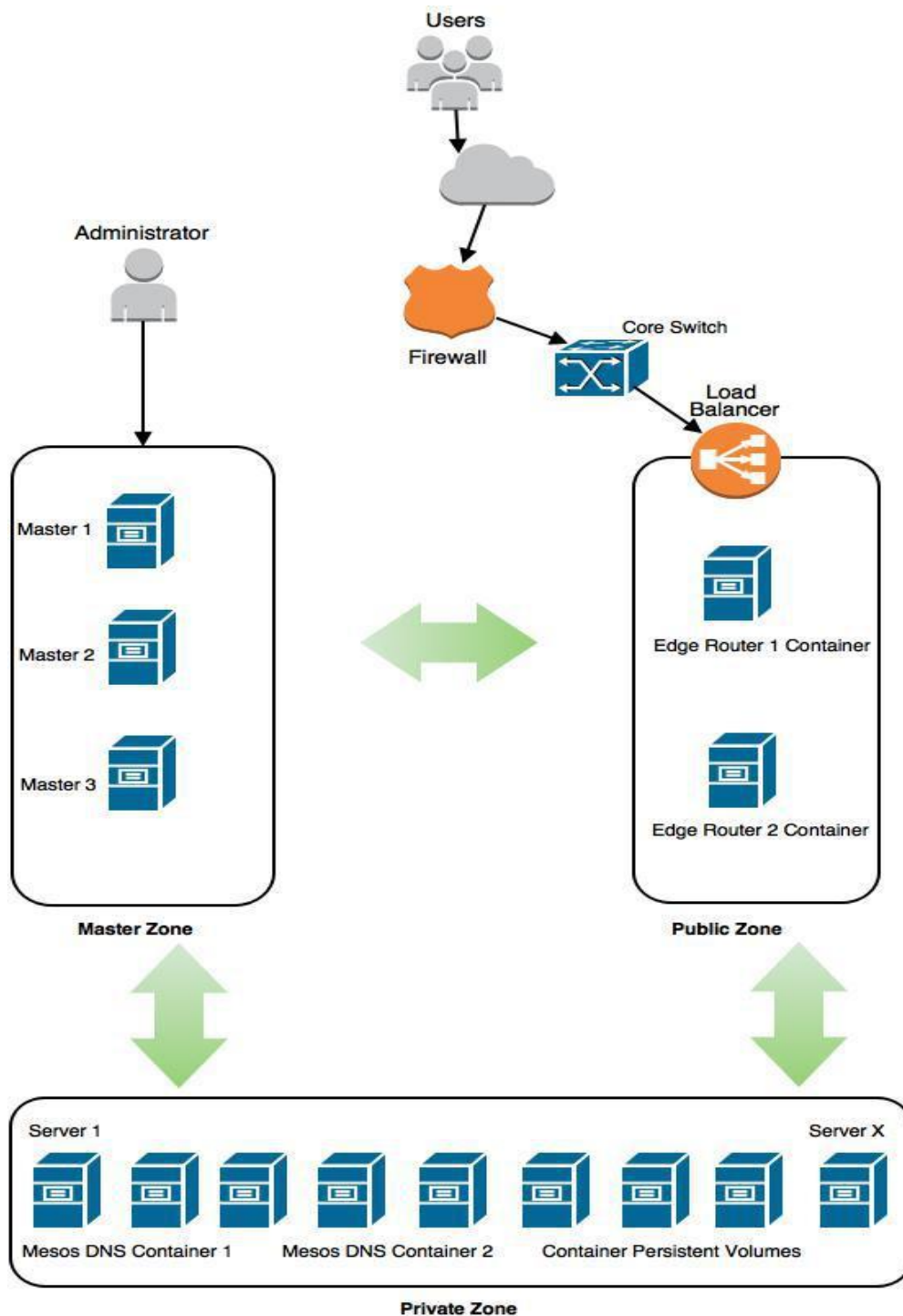Table 02 : Functionality/Capability Compliance sheet

Figure: 01 High-level reference architecture Mesosphere Cluster
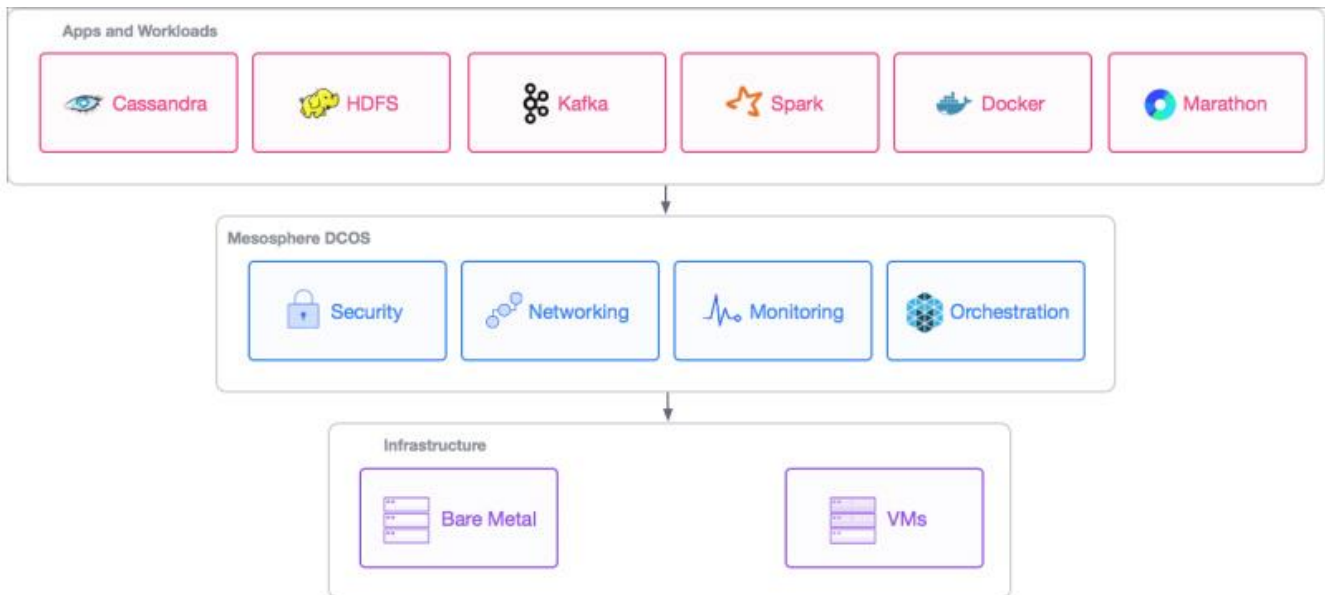
Figure: 02 Enterprise DCOS Architecture

3.3 Infrastructure Monitoring, Reporting and Alerts

Centralized monitoring is essential for of all mission-critical components including applications, services, operating systems, network protocols and systems metrics. Proposed solution basically should monitor entire mesosphere cluster and should detect security breaches, alert problem before they occur, and should alert immediately when problems arise.

3.4 Data Privacy, Security and Data Protection

Data privacy:
Service provider should be responsible for all aspects of data privacy.

Data Security Standards:
Need to follow best security practices and ensure safe and sound confidentiality and availability.

Data Protection:
- Service provider will be compliant with the following specific data protection principles;
- Respect of data subjects' rights
- Respect of data quality principles
- Requirements with regard to any data transfers outside
- Audits
- Back-ups, logs and audit trails
- Personal data breaches
- Market positioning as an economic operator
- Data portability

3.5 Data Disclosure

Service provider should not disclose any data or information originating from the LGC 2.0 and institutions and transferred in execution of the the services, actively or passively, intentionally or negligently, to any authorities, legal or natural persons. A Non-Disclosure Agreement (NDA) to be signed.

3.6 Cor-Location and Connectivity

The bare-metal servers co-located and ready for installations will be provided separately with physical access to the environment.

4. Schedule of Deliverable

No	Task:	Deadline:
1	- Deployment Architecture document	ED + 7 days
2	- Completed environment with installations, Configurations and testing - Drafts versions of other documentations	ED + 20 days
3	- UAT and commissioning - Final documentations	ED + 30 days

5. Team Composition

#	Title	Minimum Count	Engagement Model	Experience
1	Project Manager/ Account Manager	1	Part-time	8+ years of relevant IT experience Minimum 2 years of Project Management Experience in Managing Cloud projects
2	DevOps Architect	1	Part-time	8+ years of relevant IT experience Strong knowledge of cloud environments Experience with automated deployment, continuous integration, and release engineering tools Strong knowledge of infrastructure automation tools Strong knowledge and expertise in DevOps solution delivery and strategy

3	Senior DevOps Engineer (	1	Full-time and on-site (during initial installation/ configuration/testing stage up-to commissioning	5+ years of relevant IT experience Strong knowledge of cloud environments Experience with automated deployment, continuous integration, and release engineering tools Strong knowledge of infrastructure automation tools Strong knowledge and expertise in DevOps solution delivery and strategy
		1	Part-time (should be available on-site within 20 minutes for any critical incident during the maintenance period)	
4	Senior Software Engineer (	1	Full-time and on-site (during initial installation/ configuration/testing stage up-to commissioning	Proven experience in deploying software to cloud computing infrastructure; experience in SOA technologies. Experience in software development; work experience with system configuration and deployment automation technologies. Good Communication skill
		1	Part-time (should be available on-site within 20 minutes for any critical incident during the maintenance period)	

6. Service Level Agreement and Penalty Schema

Response time

Critical	Less-Critical	Non- Critical
services not working Operations have been severely disrupted.	Operations can continue in a restricted manner and a temporary workaround is available. Critical system alerts/ warnings	Applicable to non-mission critical services System alerts/ warnings

20 Minutes	45 Minutes	60 Minutes

Resolution time and penalties

Critical	Less-Critical	Non- Critical
1 Hour	2 Hours	4 Hours
LKR 20,000 per hour	LKR 10,000 per hour	LKR 5,000 per hour

Appendix A – Description of Services – Lot-3

Procurement of Service Provider for Installation, Configuration and Maintenance of Hadoop Distribution for Lanka Government Cloud 2.0

1. Introduction

Aligned with the national policy of 'Digitization of Economy', ICTA intends to implement several initiatives across the government to increase the efficiency of the government processes and to provide government services effectively and efficiently. In this context, development and improvement of digital infrastructure has been identified as a key area.

Accordingly, ICTA intends to implement an industry standard cloud environment to serve as the 'Lanka Government Cloud 2.0' (LGC 2.0) to provide efficient, cost effective, reliable and secure infrastructure services. When the current technology enhancements and trends are considered, a fully-fledged cloud environment has become an essential need and to serve to the emerging needs of the government.

The LGC 2.0 will be the central and common government cloud, and it is expected that all types of government applications will be hosted in LGC 2.0. This approach will minimize or eliminate purchasing and maintaining of servers and/or data centers by government organizations which could be time consuming, ineffective, and insecure. The objective is to eliminate all constraints and limitations to the government organizations for adopting to cloud computing strategy and thereby increase ICT usage to enhance the effectiveness and efficiency of government processes. Moreover, LGC 2.0 will support hybrid cloud model to obtain vast amount of public cloud services.

Data has become a tremendous resource, and availability of data related to the government could be effectively used for planning and decision making purposes. As a developing country with a national policy of 'Digitization of Economy', data can play a critical role. Considering this, a Big-Data cluster will also be implemented along wit LGC 2.0 to serve as the National Platform for Data Management. This will store data belong to any category, and big data analytics, support in decision making and policy development and open-data platform will be key outputs of big data cluster.

ICTA has already published the tender documents for selection of service providers for obtaining bare-metal server facilities as a service for implementing the General Cluster and Big-data Cluster of LGC 2.0.

ICTA now intends to hire a qualified service provider for obtaining the services for Installation, Configuration and Maintenance of Hadoop distribution to implement the Big-data cluster of Lanka Government Cloud 2.0.

2. Concise Statement of Objectives

Carry out the initial Installation, Configuration and Commissioning of the Big-data Cluster of LGC 2.0 on top of the bare-metal server facilities, and provide the Support and Maintenance services for a period of thirty six (36) months after commissioning.

3. Scope of Services

The selected Service Provider should deploy an enterprise level best solution for the requirements and scope of services stated below. The deployment architecture and the deployment should be in compliance to the best practices, applicable industry standards and guidelines issued by the respective distributor. Data security and confidentiality are critical throughout the project life-cycle.

a) Understanding the data sources and preparing the high-level architecture and the deployment architecture.
- The service provider should prepare the high level architecture and the deployment architecture to match with the requirements given by ICTA. ICTA will provide the details of functional and non-functional requirements. A panel appointed by ICTA will review and ratify the architecture. (refer the reference architecture given in Figure-01).
- The service provider should work collaboratively with ICTA, other related service providers and all other stakeholders organizations.
- The service provider should prepare and submit comprehensive documentations covering the standard operating procedures for the deployment and related activities.

b) Installation and configuring of the big data ecosystem.
- The service provider should install, configure and test the latest stable version of open-source Hadoop distribution on the given infrastructure. The technical specifications of the bare-metal server facilities are given in Table-01.

c) Data extraction, transformation and loading.
- Data extraction, transformation and loading (E-T-L process) from the sources made available by ICTA where it should be done in regular intervals as per the requirement of ICTA.
- A web based interface should be provided to carry out operational work as per the requirements given by ICTA.
- The proposed architecture should support multi-tenancy. Administrators should be able to manage users and grant access to resources based on each user's unique needs. They also need to be able to audit and track usage across multiple tenants and cluster.

d) Commissioning of big data ecosystem.
- Facilitate pilot operations with selected E-T-L processes as decided by ICTA
- Facilitate UAT and commissioning of Big-data cluster

e) Documentations and trainings.
- Necessary documentations such as deployment guide, maintenance and operations manual, user manual should be provided.
- Trainings to be carried out for the technical team of ICTA.
- Training plan to be formulated.

f) Operations and maintenance.
- The service provider should ensure necessary uptime and other SLAs as required by ICTA. (Refer the SLA).
- Carry out regular data platform administration and continuous performance tuning of the deployed environment.
- All the required updates/upgrades, patches and security fixes released by the respective distributor should be deployed in timely manner by the selected bidder.

(Failure to complete the compliance sheet may reject the bid)

#	Functionality	Compliance (Yes/No) * Please indicate 'Yes' or 'No' only	Remarks * Mandatory if the compliance is 'No'	Page Reference no.
1	Hadoop distibution should support unlimited number of hosts			
2	Should support multi-tenancy.			
3	provisioning, managing, and monitoring Apache Hadoop cluster/clusters(Should not be vendor locked)			
4	Multi cluster management capabilities			
5	Provide automation for the 'end to end' provisioning of a Hadoop nodes			
6	High availability (HA) support on each services			
7	Rolling upgrades			
8	The solution should have Hadoop distributed file-system architecture, providing very high aggregate bandwidth across the cluster.			
9	Ability to scale out linearly and capable of holding multiple petabytes of data.			
10	The tool should integrate and allow data mining and data research operations and integrate tightly with such tools.			
11	The unstructured data should be easy to manage and the administrative, monitoring and management features should be similar to relational database content.			
12	Platform should support different kinds of engines including • Path and Pattern Discovery • Statistical and Machine learning • Text and Sentiment Analysis • Graph Analysis • Temporal and time series Analysis			
13	Support Management of the entire infrastructure			
14	Provides essential management capabilities necessary for real-time, policy-based adaptive management and automation.			
15	Support Delegated Administration and Distributed Operations			
16	Ability to define taxonomy and arbitrary classifications, enabling business-specific tagging to be used for automated access control			
17	Ability to Collect and Process Capacity and Utilization data into charts to identify bottlenecks and view usage trends for Hadoop instances			
18	Support configuration and installation of any required application related to Hadoop			

19	Support Predictive Analytics and Resource Planning			
20	Support Time line and Event tracking for help in Root Cause Analysis			
21	continuously monitors data utilization and re-balances data placement			
22	Solution should be self managing and self healing			
23	Comprehensive dash-board			
	Security and Alerts			
1	support Kerberos authentication and Ldap authentication			
2	Role-based access control			
3	Alert management solution(eg- alert by email, user-defined triggers)			
4	Support Security and compliance policies to check for patches and security configurations			
5	Ranger or equivalent for security implementation			
	Metadata			
1	Metadata Management tool should have capabilities for data understanding, tracking, exploring, cleaning, and transformation			
2	Metadata Management tool should tracks the lineage of every dataset from the beginning when it is loaded into HDFS, throughout its entire lifecycle as it is processed, cleaned, and refined			
3	The tool should have technology that dynamically profiles datasets and collects statistics about the data stored within and should be presented to the users in order to give them a general sense of what is stored inside the datasets, including what attributes exist, what types of values are present within these attributes, and what are the statistical profiles of these values			
4	The tool automatically detects when new data is registered in HDFS or Hive, and performs this profiling without user intervention.			
5	The solution should be based on open API (like RESTful API) so that it can be extend to other Big Data environment in future			
6	Web-based GUI, which presents a graphical representation the metadata. GUI should be built using HTML5 and CSS, and communicates with the server using the aforementioned API			
7	The GUI should support removing certain entities or attributes, cleaning up the text, or merging/splitting attributes			
Backup and Restore solution				
	Regular backup of the resources must be in place. Backup frequency and retention period should be able to be customized.			

Table 01: Key Functionality Compliance Sheet

3.1 High-level Architecture of Hadoop Ecosystem to be Deployed

A reference high-level architecture of the Hadoop ecosystem is as follows.
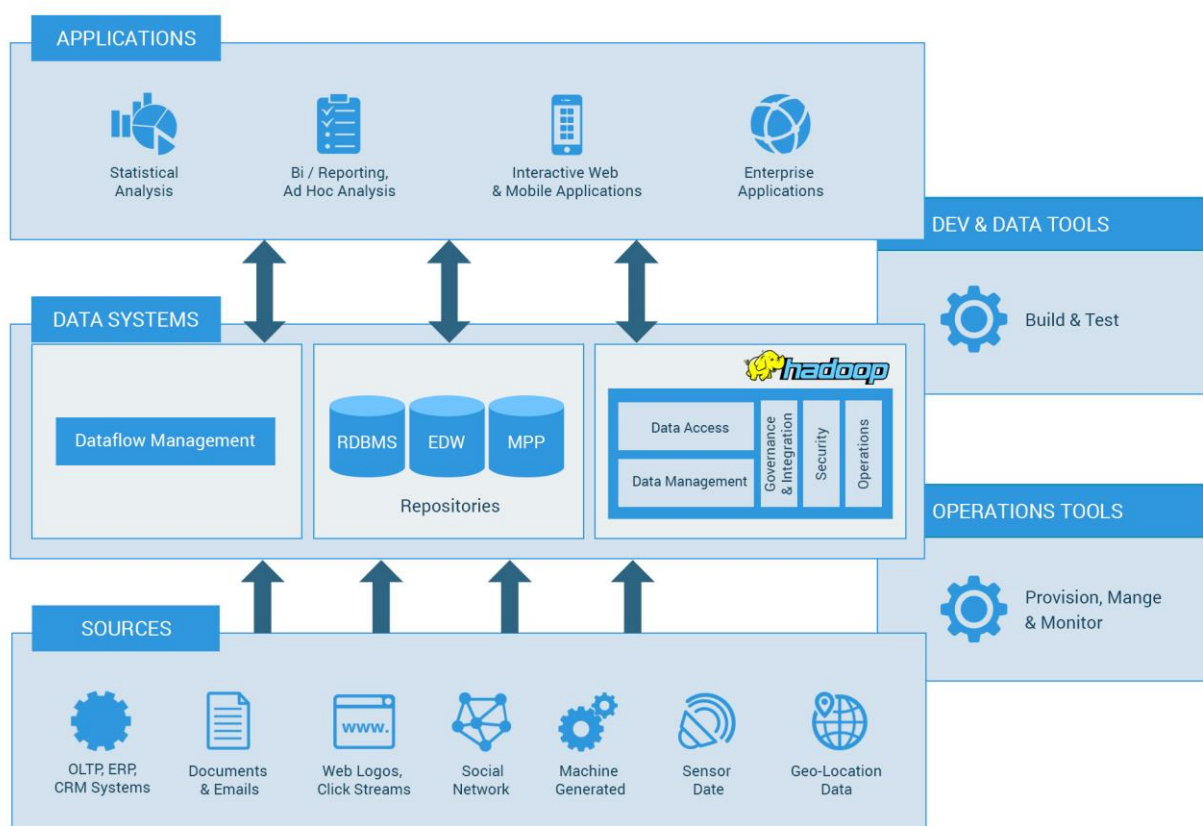
Figure-01: High-level Architecture of Hadoop Ecosystem

The above architecture will allow data platform to be integrated with existing data systems with possibility of providing interfaces to users to the Hadoop ecosystem.

- Sources – There will be various data sources where ETL (Extract, Transform, Load). procedures are needed in order to extract data into the Big-data infrastructure.
- Data platform – A Hadoop will be deployed along with other required applications.
- Repositories (Data systems) – Analyzed, summarized and frequently used data will be stored for ease of access.

- Application – This consist of the user interfaces of the big data infrastructure. Users see and interact with these components. Furthermore, APIs will be provided in order for the 3rd parties to obtain data as required.

The following diagram depicts the identified capabilities, which should present in the proposed solution.
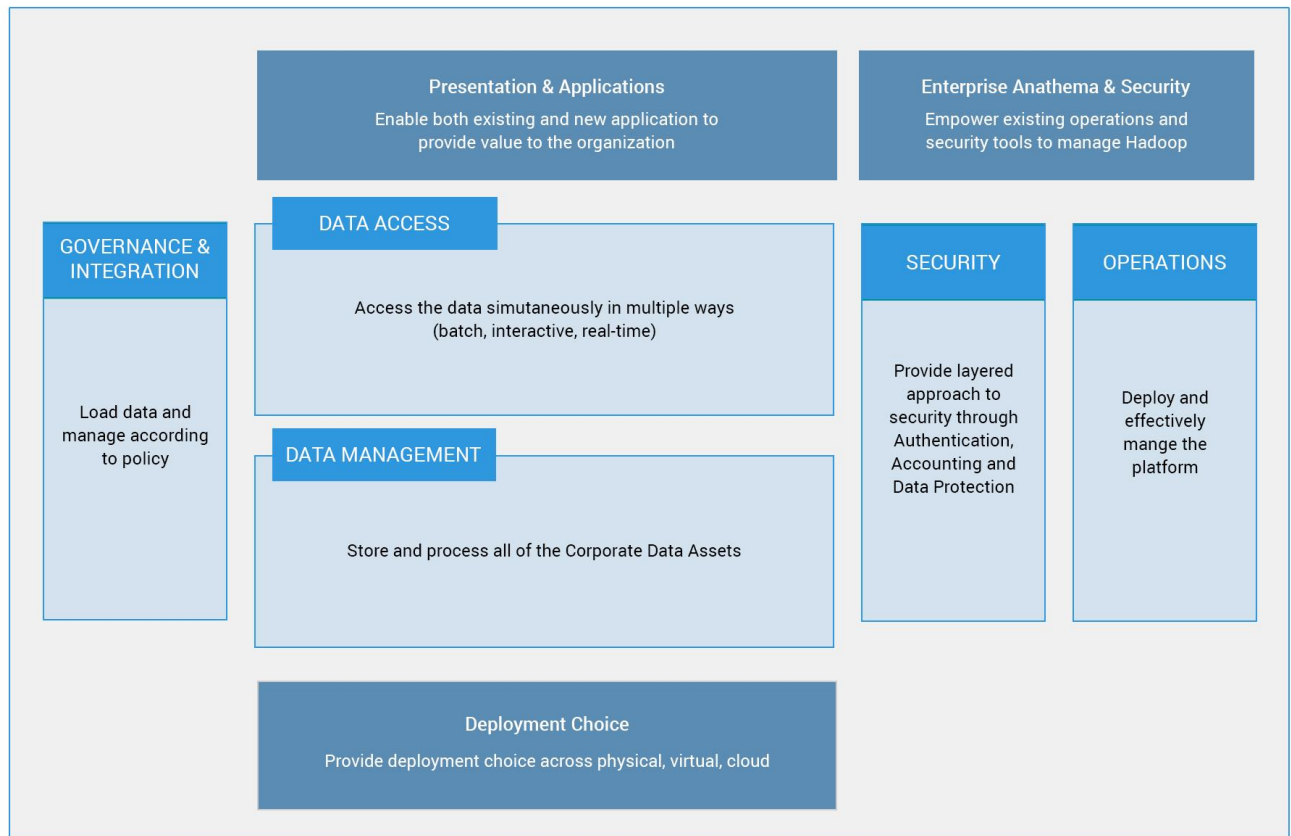
Figure-02: High-level Capability Architecture

The capabilities of the proposed solution should be aligned to the following functional and non-functional areas as foundational requirements;

- Data Management - Store and process vast quantities of data in a scale out storage layer.
- Data Access - Access and interact with the data in a wide variety of ways – spanning batch. interactive, streaming, and real-time use cases.
- Data Governance and Integration - Load data quickly, and manage according to policies.
- Security - Address requirements of Authentication, Authorization, Accounting and Data Protection.
- Operations - Provision, manage, monitor and operate Hadoop clusters at scale.

For each capability area the service provider should propose applications in order to cater the requirements. Following are the applications identified to each capability area. (The Service Provider is allowed to propose new applications for better functionality and performance.

- Data Management – HDFS
- Data Access - Hbase, Hive, Pig, Solr, Accumulo, Storm, Spark, Tez, MapReduce etc.
- Data Governance & Integration – Falcon, Atlas etc
- Security – Knox, Ranger etc
- Operations – Ambari, Zookeeper, Oozie etc

In addition to the above, proposed solution should consist of NiFi (or similar product) to support scalable directed graphs of data routing, transformation, and system mediation logic where it will consume data in motion to satisfy the mentioned requirement.

3.2 Indicative Architecture of Hadoop Infrastructure to be Deployed

- Hadoop cluster minimum raw capacity (without compression) 1 Petabyte.
- The name nodes should have high availability where the proposed 2x dedicated physical servers for the name node cluster (active and standby), 2x dedicated physical servers for a job tracker node and a monitoring and management node.
- A journal node cluster service and a zookeeper cluster service will reside on standby name node/job tracker node and monitoring and management node.

3.3 Minimum Hardware Specifications

Hardware nodes configuration is mentioned in Table-01 and 02 (The below mentioned infrastructure will be provided to the service provider in order to deploy the proposed solution).

No	Items	Specification
1	CPU	2 x Intel® Xeon® Processor E5-2600 v4 product family with QPI up to 9.6 GT/s Up to 16 cores, 35MB cache/processor
2	Memory	256GB
3	Network	40Gbe cross rack connected and Minimum 2 x Dual-port 10GbE SFP+ - 4 x 1Gbps NICs - IPMIv2 Interface.

Table-01: Data Node Hardware Configurations

No	Items	Specification
1	CPU	2 x Intel® Xeon® Processor E5-2600 v4 product family with QPI up to 9.6 GT/s Up to 16 cores, 35MB cache/processor
2	Memory	256GB
3	Network	40Gbe cross rack connected, minimum 2 x Dual-port 10GbE SFP+ - 4 x 1Gbps NICs - IPMIv2 Interface.
4	Storage	10x 3.5" / 2.5" 600GB 15k SAS

Table-02: Name Nodes/Job Tracker Node/Management and Monitoring Node
Hardware Configurations

4. Schedule of Deliverable

No	Task:	Deadline:
1	- High level architecture and the deployment architecture documents	ED + 07 days
2	- Completed environment with installations, Configurations and testing - Drafts versions of other documentations	ED + 30 days
3	- Pilot operations - UAT and commissioning - Final documentations	ED + 40 days

ED: Contract Effective Date

5. Team Composition

#	Title	Minimum Count	Engagement Model	Experience
1	Project Manager/ Account Manager	1	Part-time	8+ years of relevant IT experience Minimum 2 years of Project Management Experience in Managing Big data projects
2	Big-data Architect	1	Part-time	2 years on Big Data, 8 years on Database Architecture Expertise on structured and unstructured data Architecture of big data technology like Hadoop, HDFS, HIVE and other open source tools which are part of hadoop ecosystem Big Data use case analysis Knowledge of big data analytics RDBMS expertise Design Hadoop framework for development, testing, error log

				generation and production
				Design Hadoop architecture in terms of data sources, HDFS, structured and unstructured data, HIVE, research platform and other open source tools which are part of hadoop ecosystem
3	Data Scientist	1	Part-time	Excellent understanding of machine learning techniques and algorithms, such as k-NN, Naive Bayes, SVM, Decision Forests, etc.
				Experience with common data science toolkits, such as R, Weka, NumPy, MatLab, etc . Excellence in at least one of these is highly desirable
				Great communication skills
				Experience with data visualisation tools, such as D3.js, GGplot, etc.
				Proficiency in using query languages such as SQL, Hive, Pig
				Experience with NoSQL databases, such as MongoDB, Cassandra, HBase
				Good applied statistics skills, such as distributions, statistical testing, regression, etc.
				Good scripting and programming skills
				Data-oriented personality
4	Big Data (Hadoop) Admin	1	Full-time and on-site (during initial installation/ configuration/testing stage up-to commissioning	2 years Hadoop Admin, 3 years UNIX/Linux
				Experience in Hadoop cluster configuration in terms of
				CPU, disk space and network Bandwidth management
				Hands on experience in

#	Role	Count	Engagement	Skills/Requirements
				Hadoop configuration files like Name nodes, data nodes, Job tracker, Mapper and reducer configuration, replication factor etc

Distributed commodity server management

Installation and tuning of Hadoop cluster

HDFS and YARN installation, configuration and tuning

Configuration of HIVE, HBase and other Hadoop ecosystem

Unix / Lynx admin, security, networking, configuration

Installing of Hadoop ecosystem like Sqoop, Zookeeper etc.

Knowledge security considerations for Hadoop |
| | | 1 | Part-time (should be available on-site within 20 minutes for any critical incident during the maintenance period) | |
| 5 | Senior Software Engineer (Big-data,Hadoop Developer) | 1 | Full-time and on-site (during initial installation/ configuration/testing stage up-to commissioning) | Minimum 2 years PIG, HIVE, HDFS etc, 4 years in JAVA framework

Strong JAVA skills with JAVA frameworks

Knowledge of HDFS, YARN, HIVE, HCatalog etc

Programming skills in MapReduce, Pig, HIVE, HBase etc

Hands on experience of sqoop, flume, Tez etc.

Familiarity with Oozie, Sqoop, Flume, Ambari, Zookeeper

etc |

				Knowledge of Shell script, UNIX / Lynx

ETL tools to import data to Hadoop and export to relational databases |
| | | 1 | Part-time (should be available on-site within 20 minutes for any critical incident during the maintenance period) | |

6. Service Level Agreement (SLA)

Response time

Critical	Less-Critical	Non- Critical
Big-data ecosystem not working Operations have been severely disrupted.	Operations can continue in a restricted manner and a temporary workaround is available. Critical system alerts/ warnings	Applicable to non-mission critical services System alerts/ warnings
20 Minutes	45 Minutes	60 Minutes

Resolution time and penalties

Critical	Less-Critical	Non- Critical
1 Hour	2 Hours	4 Hours
LKR 20,000 per hour	LKR 10,000 per hour	LKR 5,000 per hour

Appendix B – Schedule of Payments

Payment for the services performed as described in this contract shall be made in currencies as specified in SCC on following basis.

Lot-1, Lot-2 and Lot-3

1- The payment on first part (for Installation, Configuration, Testing and Commissioning) will be upon final acceptance after the User Acceptance Testing (UAT).

2- Payment for Support and Maintenance services will be paid at the beginning of each year upon submission of Advance Payment Bank Guarantee for the same amount.

Appendix C – Key Personnel

Lot-1

Serial No	Team/ Team member Name	Position	Area of Expertise	Tasks and Responsibilities Assigned
1	....	Project Manager/ Account Manager	....	....
2	....	Cloud Architect	....	....
3	....	Senior System Engineer (Cloud)	....	....
4	....	Senior Software Engineer (Cloud)	....	....
5	....	Cloud Security Specialist	....	....

Lot-2

Serial No	Team/ Team member Name	Position	Area of Expertise	Tasks and Responsibilities Assigned
1	....	Project Manager/ Account Manager	....	....
2	....	DevOps Architect	....	....
3	....	Senior DevOps Engineer	....	....
4	....	Senior Software Engineer	....	....

Lot-3

Serial No	Team/ Team member Name	Position	Area of Expertise	Tasks and Responsibilities Assigned
1	....	Project Manager/ Account Manager	....	....
2	....	Big-data Architect	....	....
3	....	Data Scientist	....	....

4	....	Big Data (Hadoop Admin)	....	....
5	....	Senior Software Engineer (Big-data, Hadoop Developer)	....	....

Format of Curriculum Vitae of Key personnel

Name of the Employee	
Proposed Position	
Nationality	
Age	
Education	
Other training	
Offices Held, Academic Distinctions, Awards & Scholarships	
Language & Degree of Proficiency	
Membership in Professional Societies	
Countries of Work Experience	
Employment Record	
Period	Company & Designation
	(Could be expanded to suit requirement)
Detailed Employment Record	
Time frame	Description of Projects
	(Should be expanded to suit requirement)

Appendix D – Breakdown of Contract Price in Foreign Currency

Lot-1

1	2	3	4
Item	Description	Unit price (USD) (excluding VAT)	Total price (USD) (excluding VAT)
1	Installation, Configuration, Testing and Commissioning of OpenStack Based Cloud for General Cluster of Lanka Government Cloud 2.0 as specified in the Bid in response to requirements specified in the Bidding Documents	Not Applicable	
2	Providing Support and Maintenance services for a period of 36 months from the date of commissioning	…........... per month	Not Applicable

Lot-2

1	2	3	4
Item	Description	Unit price (USD) (excluding VAT)	Total price (USD) (excluding VAT)
1	Installation, Configuration, Testing and Commissioning of Mesosphere for General Cluster of Lanka Government Cloud 2.0 as specified in the Bid in response to requirements specified in the Bidding Documents	Not Applicable	
2	Providing Support and Maintenance services for a period of 36 months from the date of commissioning	…........... per month	Not Applicable

Lot-3

1	2	3	4
Item	Description	Unit price (USD) (excluding VAT)	Total price (USD) (excluding VAT)
1	Installation, Configuration, Testing and Commissioning of Hadoop Distribution for Big-data Cluster of Lanka Government Cloud 2.0 as specified in the Bid in response to requirements specified in the Bidding Documents	Not Applicable	
2	Providing Support and Maintenance services for a period of 36 months from the date of commissioning	…........... per month	Not Applicable

Appendix E - Breakdown of Contract Price in Local (Sri Lankan Rupees)

Lot-1

1	2	3	4
Item	Description	Unit price (excluding VAT)	Total price (excluding VAT)
1	Installation, Configuration, Testing and Commissioning of OpenStack Based Cloud for General Cluster of Lanka Government Cloud 2.0 as specified in the Bid in response to requirements specified in the Bidding Document	Not Applicable	
2	Providing Support and Maintenance services for a period of 36 months from the date of commissioning	….......... per month	Not Applicable

Lot-2

1	2	3	4
Item	Description	Unit price (excluding VAT)	Total price (excluding VAT)
1	Installation, Configuration, Testing and Commissioning of Mesosphere for General Cluster of Lanka Government Cloud 2.0 as specified in the Bid in response to requirements specified in the Bidding Document	Not Applicable	
2	Providing Support and Maintenance services for a period of 36 months from the date of commissioning	….......... per month	Not Applicable

Lot-3

1	2	3	4
Item	Description	Unit price (excluding VAT)	Total price (excluding VAT)
1	Installation, Configuration, Testing and Commissioning of Hadoop Distribution for Big-data Cluster of Lanka Government Cloud 2.0 as specified in the Bid in response to requirements specified in the Bidding Document	Not Applicable	
2	Providing Support and Maintenance services for a period of 36 months from the date of commissioning	….......... per month	Not Applicable

Appendix F – Services and Facilities provided by the employer

Not Applicable

Appendix G – Performance Incentive Compensation

Not applicable

Appendix H – Service Level Agreements

Refer Appendix A