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Request for Proposal No.: RFP 397

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

Office of the Auditor General of Canada
Bureau du vérificateur général du Canada
E-mail: suppliers@oag-bvg.gc.ca

SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document et pat la présent révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Solicitation Closes / L'invitation prend fin
At – à : **14:00 Eastern Time / 14h00 Heure de l'Est** On- le: November 27, 2023/ 27 novembre, 2023

Title/Titre: Database administration and monitoring services	
Solicitation No / Nº de l'invitation : RFP 397	**Amendment No. – Nº modif.** 003
	Date 17 Novembre 2023
Address Enquiries to / Adresser toutes questions à suppliers@oag-bvg.gc.ca	
Telephone No. / Nº de téléphone	
Destination of Goods, Services and Construction / Destination des biens, services et construction Specified Herein Précisé dans les présentes	
Instructions: Municipal taxes are not applicable. Unless otherwise specified herein all prices quoted must include all applicable Canadian customs duties, GST/HST, excise taxes and are to be delivered Delivery Duty Paid including all delivery charges to destination(s) as indicated. The amount of the Goods and Services Tax/Harmonized Sales Tax is to be shown as a separate item. **Instructions: Les taxes municipales ne s'appliquent pas. Sauf indication contraire, les prix indiqués doivent comprendre les droits de douane canadiens, la TPS/TVH et la taxe d'accise. Les biens doivent être livrés « rendu droits acquittés », tous frais de livraison compris, à la ou aux destinations indiquées. Le montant de la taxe sur les produits et services/taxe de vente harmonisée doit être indiqué séparément.**	
Vendor Name and Address / Raison sociale et adresse du fournisseur **Telephone No. / N° de telephone:**	
Name and title of person authorized to sign on behalf of vendor (type or print) / Nom et titre de la personne autorisée à signer au nom du fournisseur (caractère d'imprimerie) Name/Nom _____ Title/Titre _____ Signature _____ Date _____	

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This solicitation amendment is raised to:

1. Provide answers to Bidder questions in relation to this solicitation; and
2. Amend the RFP document as follows:
   - Fix numbering errors for sections in Annex A - Statement of work and correct the numbering for referenced sections in the SoW;
   - Add clause 7.15 - Limitation of Liability - Information Management/Information Technology under Part 7 Resulting contract clauses;

_____

Questions and Answers:

Q1: Attachment 1 to Part 3, Pricing Schedule – bullet a) refers to work described in Section III.A and Section III.C of Annex A – SOW. Please confirm that this is Section III. Description of Work and not Section III. Responsibilities. Section III is used twice in Annex A – SOW.
A1: Attachment 1 to Part 3 – Pricing Schedule refers to section III.A, III.B and III.C from Section III - Description of Work in Annex A. The Annex A – Statement of Work has been revised to correct numbering error. See RFP amendment section below.

Q2: Please describe the estimated amount of onsite work required regarding Annex A – SOW – III. C Maintenance & Development Services – bullet a)? i.e. estimated number of onsite trips/year.
A2: The majority of the work under this contract will be executed remotely. The onsite work could be requested on special occasions for instance, during the testing of OAG emergency disaster recovery. It is estimated that the max number of trips per year for onsite work will be two (2) or less.

Q3: Describe any other onsite work requirements other than what's described in question #2 above? i.e. additional estimated number of onsite trips/year.
A3: Please refer to answer A2 above.

Q4: Considering the inflation factor that now forms part of the world's economies including Canada's, would OAG consider including an economic price adjustment clause in the resulting contract?
A4: The Pricing Schedule requires the Bidder to provide separate pricing for each year of the contract and the option years, for both table 1 and table 2, which will allow the Bidder to consider economic price adjustment when providing their pricing for each contact year. No economic price adjustment clause will be included in the resulting contract.

Q5: Please provide a copy of the SRCL.
A5: There is no SRCL for this RFP.

Q6: Annex A – SOW – Section VI. Security Requirements – last sentence of the last paragraph states that, "any work off premise must be in OAG approved facilities when processing the Protected B data. Can OAG confirm that both Tier 1 applications and Non-Tier 1 applications contain Protected B data? Will suppliers have access to the data within the application or just the application itself? Please confirm that suppliers working off premise using an OAG device will satisfy the Pro B requirements, i.e. using an OAG device satisfies the OAG approved facility requirement when working off premise?
A6: All Database must be considered having up to Protected B data regardless of the applications and Tiers. Using an OAG device satisfies Protected B requirements for off premise work if the device is used in Canada. The supplier will not have access to the applications.

Q7: Advise if there are any EU data considerations that might impact compliance with GDPR? Provided suppliers have access to data within the Tier 1 and Non-Tier 1 applications.
A7: There are no EU GDPR data considerations.

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Q8: Limitation of Liability: Pursuant to Section 24 of SACC 2035, the contractor takes on an unlimited liability. The contractor assumes all risks associated with providing the services. This does not represent a standard industry allocation of risk. We respectfully request that the OAG include in the articles of agreement of the resulting contract the standard IM/IT limitation of liability SACC - N0000C.
A8: PART 7 - RESULTING CONTRACT CLAUSES of the RFP has been amended to add clause 7.15 - Limitation of Liability - Information Management/Information Technology from SACC manual. See RFP amendment section below.

Q9: How many physical locations are the databases in scope located? Where are they?
A9: The databases are all located in the NCR within two sites, 240 Sparks street (HQ) and the MacDonald Cartier Data Center near the Ottawa airport (Emergency/Disaster Recovery site).

Q10: Are the server's bare metal or virtualized servers within a platform like VMWare?
A10: The OAG has both these types of servers.

Q11: Is the storage for the Databases local? What is the type of storage used?
A11: The OAG has both, SAN based storage and local storage depending on the application it serves.

Q12: Upon completion the Linux OS upgrade to v8.7 for the Oracle Production, will the OAG be reducing the number of development and user acceptance environment servers? If, yes what will be the new count?
A12: The OAG has no plan to reducing the number of development and user acceptance environment servers at this time, regardless of the platform.

Q13: Can you provide a currency roadmap of the Oracle (RDBMS) version upgrades for the next three years?
A13: No we cannot, this will be done in consultation with the selected supplier from this RFP.

Q14: Is there a plan to upgrade the Microsoft windows Server 2012R2?
A14: Yes, the plan is to upgrade Microsoft Windows Server 2012R2 by 31 March, 2024.

Q15: Can you provide the expected timing of the move from SQL Server 2014 to the 2016 Enterprise edition?
A15: We are unable to provide a timing at this time.

Q16: Are any of the above Databases in a clustered configuration at the Server/OS layer? If yes, can you describe the associated configuration?
A16: Regardless of the Server/OS clustered configuration used at the OAG, the selected supplier must be able to support it.

Q17: Are any of the above Database instances in a clustered configuration at the RDBMS layer? If yes, can you describe the associated configuration?
A17: Regardless of the RDBMS clustered configuration used at the OAG, the selected supplier must be able to support it.

Q18: Does your production environment include Disaster Recovery instances? If yes, is there any active/active or active/passive configurations between Production and Disaster Recovery? Please provide configuration details?
A18: Yes, we have Emergency/Disaster Recovery Instances. There is no active/active or active/passive configurations. We only use manual log shipping.

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Q19: What are the monitoring, management and synchronization tools currently in use for the databases in scope?
A19: The current monitoring method is done with alerts configured within the database. We have no other tools currently implemented.

Q20: Where are the backups going? What is OAG backup system and management?
A20: We are using a Commvault backup tool. The backups are done on premise and kept at our DR facility.

Q21: How many OAG devices does OAG expect to provide the bidder? We would require a laptop for each DBA on the team. Oracle and SQL on call rotation is done by a pool of resources, estimated number of required laptops is +/-10.
A21: OAG will issue a laptop for each DBA resource working under this contract. The number of resources required to work on the contract is up to five (5) resources.

Q22: What is the upgrade plan for Oracle 10.2, Oracle 11.2 and Oracle 18.12 environments that are no longer under support by Oracle?
A22: There is no specific plan at this time. Those are referencing historical data and are not considered Tier 1.

Q23: What is the service level exception policy for end of life platforms and products that are under service provider support?
A23: For the platforms no longer supported by the DB supplier or at the end of life, the service level is 'best effort'.

Q24: Is extended vendor support purchased for the Oracle database and Microsoft SQL server platforms?
A24: No.

Q25: Does the support staff need to speak any other language other than English?
A25: The language requirement for carrying out the work under this contract is English. Bilingualism is not a requirement for the support staff.

Q26: Annex A – SOW – Section III.B Database Monitoring Services – bullet i – Contractor must provide its own technology/monitoring tools. Will OAG provide the underlying infrastructure to support the tools, or should the contractor provide the hardware and software to support the monitoring solution?
A26: The OAG will provide the underlying infrastructure required as long as the infrastructure requested and the monitoring tool comply with OAG's Cybersecurity standards.

Q27: Which organization will be managing the underlying operating systems, server hardware, storage, networking, security and data center facilities?
A27: The OAG will be managing the underlying operating systems, server hardware, storage, networking, security and data center facilities.

Q28: What is the backup and recovery mechanism used for the supported databases, and will OAG continue to support the existing backup and recovery environment, including DB agent support/maintenance?
A28: The backup mechanism is done via the Commvault DB agent and the OAG will continue to support the existing backup and recovery environment, including the DB Backup agent support and maintenance.

Q29: Describe any ongoing or future projects to remove any Single Points of Failure.
A29: The OAG does not have ongoing or future projects to remove any SPF.

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Q30: Describe the HA, clustering, AOAG, etc setup in the Oracle and MSSQL environments.
A30: There is no clustering in Oracle. HA is performed manually with replication between the primary and secondary servers and Log Shipping to the DR site.

Q31: What replication type is used to synchronize data to the DR site, and will this method(s) continue?
A31: Manual Log Shipping

Q32: Is participation in a disaster recovery test exercise in scope, and if so, what is the test frequency and duration that the contractor administrators would be included in?
A32: Yes, yearly frequency. It usually lasts one weekend; however, the OAG reserves the right to perform more than one Emergency Recovery exercise per year.

Q33: What SIEM is currently in place that the database events will log events to?
A33: IBM QRadar is the OAG SIEM; however, we do not use it to log events for databases at this time.

Q34: Is OAG or supplier responsible for Oracle and MS SQL enterprise licensing costs?
A34: The licensing costs is covered by OAG

Q35: Would the Oracle upgrade be considered as part of the deliverables under Annex A – SOW - Section III. Description of Work – either subsection A, B, or C?
A35: Yes

Q36: Annex A – SOW – Section III.A Database Administration support services - bullet b) database object and security management. Please elaborate on OAGs expectations for Security management? I.e what does it entail?
A36: Security Management is defined as Access Management.

Q37: Annex A – SOW – Section III. B and C – Reporting Timeframes: Within 1 Hours. How will the supplier monitoring tool be integrated with the existing monitoring/paging tool? Will suppliers be able to integrate their own paging tool? If yes, please include paging tool as in scope for Section III. B Database Monitoring Services. Furthermore, how will the monitoring and paging tool be integrated with OAG's Problem Management tool?
A37: The monitoring tool is the responsibility of the supplier. Meeting the service levels is also the responsibility of the supplier with their own notification method (paging tool or others). The OAG does not have a paging tool currently. There is no expectation of integration with OAG's Enterprise Service Management (ESM) Tool.

Q38: Annex A – SOW – Section III. B – bullet iii. – sub-bullet g. - states, "Setting up and storing incremental information in repositories for each environment (Production, User Acceptance and development) with metrics, host/database, scripts". Can OAG please elaborate on what type of incremental information is anticipated and what type of repositories will be needed I.e. DB, file storage, Sharepoint, other?
A38: The incremental information mostly refer to collecting metrics about the performance and functions of the database. The repository required is up to the supplier to define. Whatever works best with their monitoring tool.

Q39: Annex A – SOW – Section III. B – bullet v. – can OAG clarify what is "OAG Analysis Services and OAG Integration Services"?
A39: Those two services refer to our Data warehouse.

Q40: Just to be clear the required services are strictly for database including database infrastructure? And does not require logical database support services such as creation and management of the data?
A40: Correct, it does not include logical database support services.

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Q41: Given the questions above will require time for OAG to answer, and then time for suppliers to receive and integrate into their solutions, we respectfully request a 2-week extension to the bid submission date.

A41: As per Amendment # 2, the end date has been extended to November 27, 2023;

RFP Amendment:

1. In the RFP document, delete Annex A – Statement of work entirely and replace it with the one provided on pages 8 to 14 of this amendment.

2. Under Part 7 - Part 7 Resulting contract clauses of the RFP document **add** the following clause:

7.15 Limitation of Liability - Information Management/Information Technology

(a) This section applies despite any other provision of the Contract and replaces the section of the general conditions entitled "Liability". Any reference in this section to damages caused by the Contractor also includes damages caused by its employees, as well as its subcontractors, agents, and representatives, and any of their employees. This section applies regardless of whether the claim is based in contract, tort, or another cause of action. The Contractor is not liable to Canada with respect to the performance of or failure to perform the Contract, except as described in this section and in any section of the Contract pre-establishing any liquidated damages. The Contractor is only liable for indirect, special or consequential damages to the extent described in this Article, even if it has been made aware of the potential for those damages.

(b) **First Party Liability**:

    (i) The Contractor is fully liable for all damages to Canada, including indirect, special or consequential damages, caused by the Contractor's performance or failure to perform the Contract that relate to:

        (A) any infringement of intellectual property rights to the extent the Contractor breaches the section of the General Conditions entitled "Intellectual Property Infringement and Royalties";

        (B) physical injury, including death.

    (ii) The Contractor is liable for all direct damages caused by the Contractor's performance or failure to perform the Contract affecting real or tangible personal property owned, possessed, or occupied by Canada.

    (iii) Each of the Parties is liable for all direct damages resulting from its breach of confidentiality under the Contract. Each of the Parties is also liable for all indirect, special or consequential damages in respect of its unauthorized disclosure of the other Party's trade secrets (or trade secrets of a third party provided by one Party to another under the Contract) relating to information technology.

    (iv) The Contractor is liable for all direct damages relating to any encumbrance or claim relating to any portion of the Work for which Canada has made any payment. This does not apply to encumbrances or claims relating to intellectual property rights, which are addressed under (i)(A) above.

    (v) The Contractor is also liable for any other direct damages to Canada caused by the Contractor's performance or failure to perform the Contract that relate to:

        (A) any breach of the warranty obligations under the Contract, up to the total amount paid by Canada (including any applicable taxes) for the goods and services affected by the breach of warranty; and

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(B)   Any other direct damages, including all identifiable direct costs to Canada associated with re-procuring the Work from another party if the Contract is terminated either in whole or in part for default, up to an aggregate maximum for this subparagraph (B) of the greater of .75 times the total estimated cost (meaning the dollar amount shown on the first page of the Contract in the cell titled "Total Estimated Cost" or shown on each call-up, purchase order or other document used to order goods or services under this instrument), or $1,000,000.00.
In any case, the total liability of the Contractor under subparagraph (v) will not exceed the total estimated cost (as defined above) for the Contract or $1,000,000.00, whichever is more.

(vi)   If Canada's records or data are harmed as a result of the Contractor's negligence or willful act, the Contractor's only liability is, at the Contractor's own expense, to restore Canada's records and data using the most recent back-up kept by Canada. Canada is responsible for maintaining an adequate back-up of its records and data.

(c)   **Third Party Claims**:

(i)   Regardless of whether a third party makes its claim against Canada or the Contractor, each Party agrees that it is liable for any damages that it causes to any third party in connection with the Contract as set out in a settlement agreement or as finally determined by a court of competent jurisdiction, where the court determines that the Parties are jointly and severally liable or that one Party is solely and directly liable to the third party. The amount of the liability will be the amount set out in the settlement agreement or determined by the court to have been the Party's portion of the damages to the third party. No settlement agreement is binding on a Party unless its authorized representative has approved the agreement in writing.

(ii)   If Canada is required, as a result of joint and several liability or joint and solidarily liable, to pay a third party in respect of damages caused by the Contractor, the Contractor must reimburse Canada by the amount finally determined by a court of competent jurisdiction to be the Contractor's portion of the damages to the third party. However, despite Sub-article (i), with respect to special, indirect, and consequential damages of third parties covered by this Section, the Contractor is only liable for reimbursing Canada for the Contractor's portion of those damages that Canada is required by a court to pay to a third party as a result of joint and several liability that relate to the infringement of a third party's intellectual property rights; physical injury of a third party, including death; damages affecting a third party's real or tangible personal property; liens or encumbrances on any portion of the Work; or breach of confidentiality.

(iii)   The Parties are only liable to one another for damages to third parties to the extent described in this Sub-article (c).

ANNEX "A"

STATEMENT OF WORK

Database Administration and Monitoring Services

I. OBJECTIVE

The Office of Auditor General of Canada (OAG) requires database administration and monitoring services to proactively manage and monitor all activities related to high-value databases and their respective environments. The Contractor must provide database administration support and monitoring services, which include database monitoring tools as needed.

II. OPERATING ENVIRONMENT

A. **Application Environment:**

Tier 1 applications are systems that are considered critical to the conduct of audits, which include OAG's document management system and audit tool. Non-Tier 1 applications are those that are used by management and corporate services to ensure resources (financial and people) are available to complete audits or are used by management to plan audits.

B. **Database Environment:**

The database ecosystem at the Office of Auditor General of Canada (OAG) is made of three (3) environments referred to as Development (DEV), User Acceptance (UAT) and Production (PRD).

The following describes the current OAG Database environment:
a. The OAG Oracle Relational Database Management System (RDBMS) production environment consists of:
- eleven (11) databases* (instances) running on an Oracle Linux v6.10 server
- one (1) database (instance) running on Oracle Linux v8.7 server

For a total of 12 Oracle databases (instances) representing about 165 GB of space.

Note: currently upgrading the 11 databases (instances) Oracle Linux v6.10 server with Oracle Linux v8.7 with expected completion for September 30th, 2023.

b. The OAG Oracle Relational Database Management System (RDBMS) production database (instance) versions are:
- one (1) v19.17;
- one (1) v18.12;
- five (5) v11.2;
- five (5) v10.2

c. The OAG Oracle Relational Database Management System (RDBMS) development and user acceptance environment consists of:
- eighteen (18) databases (instances) running on an Oracle Linux v6.10
- fifteen (15) database (instances) running on Oracle Linux v8.7 server

For a total of 33 Oracle databases (instances) representing about 1,286 GB of space.

d. The OAG Oracle Relational Database Management System (RDBMS) development and user acceptance database (instance) versions are:
- fifteen (15) v19.17;
- seven (7) v18.12;
- two (2) v12.2;
- eight (8) v11.2;
- one (1) v10.2

An instance is defined as the combination of the system global area (SGA) and background processes. An instance is associated with one and only one database.

e. The OAG Microsoft SQL Server production environment consists of:

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- Six (6) Microsoft SQL Server 2014 databases running on Microsoft Windows Server 2012R2;
- Four (4) Microsoft SQL Server 2016 databases running on Microsoft Windows Server 2019 including the cluster.

For a total of ten (10) Production Microsoft SQL Server databases representing about 1,779 GB of space.

f. The OAG Microsoft SQL Server User Acceptance consists of:
- Four (4) Microsoft SQL Server 2016 databases running on Microsoft Windows Server 2019;

g. The OAG development environment consists of:
- Five (5) Microsoft SQL Server 2014 databases running on Microsoft Windows Server 2012R2;
- Three (3) Microsoft SQL Server 2016 databases running on Microsoft Windows Server 2019.

For a total of twelve (12) User Acceptance and Development Microsoft SQL Server databases representing about 6,644 GB of space

Note: The SQL Server production environment consists of SQL Server 2014 Standard eventually moving to 2016 Enterprise editions supporting COTS, Microsoft .NET and Business Intelligence software in a high availability environment.

III. DESCRIPTION OF WORK

In consideration of the operating environment described in section II, the required work consists of database administration and support services (described herein at sub-section A); database monitoring services (described herein at sub-section B); maintenance and development services (described herein at sub-section C). Note that reports introduced in this section are summarized in section V, Reporting Requirements.

A. Database administration support services:

The Contractor must provide database administration support services to assist in the management of the current Oracle and Structure Query Language (SQL) Server DEV, UAT and PRD environments. The databased administration support services include the following tasks:

a) assistance with database management,

b) database object and security management,

c) performance tuning,

d) database upgrades and environment patching,

e) jobs scheduling (automation of backups, alerts and database statistics, etc.),

f) databases availability monitoring,

g) disaster recovery site synchronization (management of the standby databases), and

h) creation and maintenance of repositories for storing incrementally metrics information related to health indicators for each Oracle and SQL Server DEV, UAT and PRD environments.

At least once a month, the contractor must provide training, coaching and information to employees identified by the OAG Technical Authority (TA) on all relevant toolsets, scripts and capabilities used by the vendor to ensure all environments operate properly.

Contractor must provide database administration support services for the OAG Oracle and Microsoft SQL databases for DEV, UAT and PRD environment, ensuring tasks are performed proactively to ensure high availability (99.9%) of the databases. The work provided must include both off-site (remote) and on-site database administration services. It is expected that some of the work will fall outside of regular working hours (07:00–17:00 hrs Ottawa time, Monday to Friday) and will necessarily involve some work on evenings and week-ends.

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B. Database monitoring services

The Contractor must provide all the necessary human and technology resources to meet the OAG databases monitoring requirements described in this section. The Contractor must also assist in the configuration and installation of components to monitor multiple zones in data centre environments.

The Contractor must provide database monitoring and support and perform tasks on either a daily or weekly basis as follows:

i. Contractor must use its own monitoring technology/tools needed to perform the monitoring tasks listed below. It is important to note that the monitoring tool must be approved by the OAG Security unit prior to installing it on the OAG equipment (refer to section VII, Security Requirements, below).

ii. Daily, the Contractor must verify the proper operation of all the PRD, UAT and DEV databases (starting with PRD first) and take appropriate action to rectify any problems by:
   a. Verifying all databases are up and taking necessary actions as required;
   b. Ensuring that the nightly backups have been completed successfully, and implementing corrective measures as needed;
   c. Verifying that there are enough personnel available to ensure that environments are working as expected without performance issues for Input/Output throughput and application response times;
   d. Verifying free spaces on tablespaces;
   e. Verifying rollback segments;
   f. Identifying space-bound objects (next extents);
   g. Reviewing CPU, memory and disks space;
   h. Verifying logs, errors, events, and ensuring that all logs for databases are sent to Security Information and Event Management (SIEM) as well as taking all necessary actions as required;
   i. If issues arise in PRD, UAT and DEV environment within normal working hours or outside of normal working hours, the Contractor must report and resolve the issues as per timeframes specified in the following table:

Database Environment	Critical application (Tier-1) Timeframes	Non Critical application (non Tier-1) Timeframes
PRD environment	Report Issue Time: Within 1 Hour Resolving Issue Time: Within 24 Hours	Report Issue Time Within 2 Hours Resolving Issue Time: Within 24 Hours
UAT and DEV environment	Report Issue Time: Within 2 Hours Resolving Issue Time: Within 24 Hours	Report Issue Time: Within 4 Hours Resolving Issue Time: Within 48 Hours

iii. On a weekly basis, the Contractor must analyze the Oracle and SQL Server PRD, UAT and DEV databases to assess space usage and growth, and make recommendations to ensure that the PRD, UAT and DEV environments operate correctly. Once the analysis has been completed, the recommendations are to be included in a separate report to the OAG Technical Authority, within 5 business days, who will review and approve before the Contractor applies changes. The work will include:
   a. Monitoring and graphing of system performance;
   b. Monitoring space usage and trends;
   c. Monitoring database error log followed by analysis and resolution as required;
   d. Verifying fragmentation of tablespaces;
   e. Assessing disk space availability;
   f. Assessing database utilization and performance, optimizing queries;
   g. Setting up and storing incremental information in repositories for each environment (Production, User Acceptance and development) with metrics, host/database, scripts;

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iv. On a weekly basis (it should be daily if issues with critical applications occur), the Contractor must be:

    a. Reporting information on monitoring activities, alerts, problem, incidents detection tools and reporting capabilities. These could be included in the same incident report as in section B.iii above, along with recommendations towards the health of DEV, UAT and PRD environments.

    b. Generating dashboard with the Health indicators of the environment including inventory information (e.g., version, group, type of the databases and its related toolsets). Information should include the history of changes and configuration management actions performed on each environment (e.g., root cause analysis with details for troubleshooting with corresponding error codes, trending analysis on performance of each environment, reports on testing the change for each environment), and providing problem detection capabilities with supporting reports (e.g., log on recurring errors, events, problem for each environment).

v. Monitoring the OAG Analysis Services and Integration Services in the Microsoft SQL Server PRD, UAT and DEV environments as follows:

    a. The Contractor must provide monitoring services in order to maintain production and user acceptance environments in a high availability (99.9%) setup, which includes but is not limited to, database mirroring, clustering and transaction logs shipping to Security information and event management (SIEM). The SQL Server databases support the OAG main audit management software.

vi. The Contractor must also provide necessary resources, human or technological (monitoring software), to operate in a Remote Disaster Recovery (DR) site within Canada running both Oracle and SQL Server databases for the PRD environment for twenty-four (24) hours per day and seven (7) days a week (24/7).

C. **Maintenance & development services**

The Maintenance & development requirement involves the following services:

An initial review of the current database configurations, storage parameters, memory parameters, backup strategy, security strategy and application workload. The results of this review must include recommendations and necessary modifications to ensure proper operation of the Oracle and SQL Server DEV, UAT and PRD environments.

    a) The Contractor must provide, on-site or remotely using OAG devices, DBA services to manage and execute the planned upgrade to the RDBMS software or any other scheduled maintenance tasks (including Security patch/upgrade from Oracle, etc.). Detailed plan and maintenance tasks will be documented prior to commencing the work and must include testing activities being done in partnership with OAG staff. Work to be performed must adhere to standards and best practices, and will involve research activities as needed.

    b) The Contractor must provide database development and maintenance services to rectify problems with DEV, UAT and PRD environments.

        i. This work could require both on-site and/or off-site work. Contractor will ensure that backups are working properly for each environments (DEV, UAT and PRD for all sub-groups/levels). A backup shall be deemed successful when all sublevels can be seamlessly recovered.

        ii. If issues arise in PRD, UAT and DEV environments within normal working hours or outside of normal working hours, the Contractor must respond and resolve the issues as per timeframes specified in the following table:

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Database Environment	Tier I application	Non Tier-I application
PRODUCTION	Response Time: Within 1 Hour Resolution Time: Within 24 Hours	Response Time: Within 2 Hours Resolution Time: Within 24 Hours
UAT and Dev	Response Time: Within 2 Hours Resolution Time: Within 24 Hours	Response Time: Within 4 Hours Resolution Time: Within 48 Hours

c) It is also recognized that there may be issues that will require additional time to resolve, especially if it involves the assistance of an outside vendor such as Oracle Corporation or Microsoft. The Contractor must assist OAG staff in leading and managing with the vendor (such as Oracle Corporation and Microsoft) the resolution of issues, and provide a weekly formal status report to the OAG Technical Authority for critical application (Tier 1) problems.

d) Maintaining the OAG Analysis Services and Integration Services in the Microsoft SQL Server production, user acceptance and development environments.

e) The Contractor is responsible for maintaining the Microsoft SQL Server production and user acceptance environments in a high availability setup, which includes but is not limited to, database mirroring, clustering and transaction logs shipping to Security information and event management (SIEM). The SQL Server databases support the OAG main audit management software.

f) The Contractor must also provide necessary resources, human or technological (monitoring software), to operate in a Remote Disaster Recovery (DR) site within Canada running both Oracle and SQL Server databases for the PRD environment for twenty-four (24) hours per day and seven (7) days a week (24/7).

IV. RESPONSIBILITIES

A. OAG Responsibilities

The OAG will:
i. Inform the Contractor of any activity that may affect the project deliverables or deadlines.
ii. Provide access to departmental networks.
iii. Provide regular feedback to Contractor on emerging issues or concerns.
iv. The OAG Technical Authority will provide the successful Contractor with existing documentation on an appropriate media. All documentation provided to the Contractor must be returned to the Technical Authority upon completion of the contract. The Technical Authority will also set-up the necessary mechanism and will provide the equipment and software to allow the Contractor to connect securely to the OAG network. No copy of the data is permitted.

B. Contractor Responsibilities

The Contractor will:
i. Provide support to the OAG during the Threat and Risk Assessment and Security Authorization Assessment and Authorization (Certification Process) for the Contractor's monitoring tool/technology;
ii. Provide support to OAG for performing Vulnerability Assessments against installed components of Contractor's monitoring tool/technology;
iii. Communicate any problems or obstacles that may hinder the Contractor's ability to complete any necessary tasks and provide the deliverables outlined in this Statement of Work with OAG resources as soon as they arise.
iv. Work with OAG resources to resolve any issues that may arise during the course of their work on this contract.
v. All work will be carried out in close consultation with OAG resources.

V. REPORTING REQUIREMENTS

The OAG technical authority shall receive a formal status report following the resolution of any problem affecting tier 1 applications for all environments described in the SoW. The report shall take the form of a

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Root Cause Analysis (RCA) and include information such as, but not limited to: time of event, systems affected, duration, scope and impact, stakeholders, description of the issue, corrective actions and key takeaways. In the event that resolving the issue involves an outside vendor, the Contractor shall provide a weekly formal status report to the OAG Technical Authority for critical application (Tier 1) problems.

The Contractor must also provide a monthly status report to be submitted with the invoice. The monthly report should include at minimum the following information:
   i.   Associated incidents occurred during the period of reference - referencing the incident report provided: date of incident, subject/title of incident provided to OAG Technical Authority;
   ii. Weekly reports submitted for Database monitoring and support tasks (see section III.B);
   iii. Weekly Status reports submitted for Maintenance & development service (see section III.C).

The following table summarises the reporting requirements for the Contractor referencing the respective section in the SoW:

Report name	Description	Frequency
RCA Status report	Provided for any Tier 1 application issue on all environments ((DEV,UAT, PRD), as described in section V. of SoW	On an as needed basis, 5 business days following the resolution of the issue. **AND** Weekly for issues involving outside vendors until complete resolution.
Database Monitoring reports	As per section III.B.iii and III.B.iv above	Weekly
Database maintenance report	As per section III.C.c above	Weekly for issues involving outside vendors until complete resolution of the issue.
Monthly report	Provided with the invoice as described in section V. of SoW and to be accepted by Technical Authority.	Monthly

VI. WORK LOCATION AND TRAVEL

The Work required to deliver database administration, support and monitoring, development and maintenance services will be performed mainly remotely and occasionally on-site at OAG head office in Ottawa at 240 Sparks Street. The OAG will provide the necessary facilities to perform any on-site DBA work, as required. No travel expenses will be reimbursed to perform the work under this contract.

VII.   SECURITY REQUIREMENTS

The Contractor must use an OAG laptop to access the OAG network, and the Contractor must provide monitoring services including its monitoring tool. The OAG Security group will be assessing the monitoring tool, prior to installing it on the OAG equipment. The Contractor must provide the information and supporting documentation about the software, which answers all of the following:

   1. Information about the software/developer/vendor/country of origin
   2. How the software interacts with the OS and external connection
   3. Key Features of the software
   4. Information Flow of the software
   5. Network connection & integration with existing infrastructure
   6. Existing vulnerabilities and patch release frequency of the vendor
   7. Any information that is collected by the vendor/software

All Contractor personnel will possess a Government of Canada (GoC) security clearance at a minimum of Reliability Status prior to commencing any work under the Contract.

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Contractor must agree to follow the OAG Security rules and regulations when working on-site or remotely (e.g. rules related to issuance of an Entrust (PKI) certificate). Connection to the OAG network will be done using only approved OAG supplied software and hardware equipment.

When conducting off-site work, the Contractor agrees to follow the rules and regulations associated with the issue of an Entrust (PKI) certificate. Connection to the OAG network will be done using only approved OAG supplied software and hardware equipment. Under no circumstances should any additional software be installed on the OAG supplied equipment unless specifically authorized by the OAG Technical Authority. In addition, any work off premise must be in OAG approved facilities when processing the Protected B data.