City of Richmond

Report to Committee

To:	General Purposes Committee	**Date:**	April 26, 2021
From:	Grant Fengstad Director, Information Technology	**File:**	04-1370-01/2021-Vol 01

Re: **Oracle RAC Enterprise and Solaris SPARC Server Upgrades**

Staff Recommendation

1) That 7191NOITC – Oracle Database Software and Solaris Hardware Purchase be awarded to Eclipsys Solutions Inc., in the amount of $850,000 as part of the 2021 capital plan; and

2) That the Chief Administrative Officer and Acting General Manager, Finance and Corporate Services be authorized to execute the contract and all related documentation with Eclipsys Solutions Inc.

Grant Fengstad
Director, Information Technology
(604-276-4096)

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Finance Purchasing	☑ ☑	Acting GM, F&CS
SENIOR STAFF REPORT REVIEW	**INITIALS:** MO	**APPROVED BY CAO**

Staff Report

Origin

The City of Richmond ("City") critical business functions utilize a mission-critical database environment in City data centres operating on Oracle RAC (real application clusters). Applications support Property and Land Use (AMANDA), Engineering and Public Works (INFOR Public Sector), Geographic Information System (ESRI GIS), PeopleSoft Human Resources and Payroll (PeopleSoft HCM), PeopleSoft Financials (PeopleSoft FIN), Tempest Taxation / Licensing (Tempest), TIBCO Middleware Enterprise Service Bus (ESB) and ForgeRock Identity and Access Management Systems serving approximately 2,000 employees and over 80,000 registered MyRichmond customers. The Oracle RAC environment was originally installed in 2014 with the original Solaris server hosting environment. The City currently employs two computer data centers located at City Hall and the Public Works site. This enables the City to operate without service disruption due to local failures at each specific site due to the high level of redundancy. The City subscribes to Oracle for the support of its database products through an annual Premier Support licensing model. Premier support provides comprehensive database maintenance and software upgrades that include bug fixes and enhancements and critical security patches for licensed Oracle database products.

In September 2019, IT did some exploratory research into replacing its end of life database infrastructure. The need to upgrade its database software and servers comes from a result of the following factors:

1. Oracle has updated its licensing model that now requires organizations to update to Oracle Enterprise Edition in order to have RAC (High Availability Clustering) as an option.

2. The City must ensure that database software is maintained to the latest versions in order to ensure continuous support with security and bug fixes being provided by Oracle.

3. The City currently has database servers that are now over seven years old that are no longer supported.

4. Support for additional databases to support new corporate directives and initiatives is no longer possible under the current infrastructure without upgrading to newer database software and servers.

The analysis involved a comparison of upgrading the City's current premise-based (onsite) Oracle RAC infrastructure versus implementing as a database as a service (DBaaS) hosted solution, namely a Cloud service. Based on the discovery findings, it is recommended to continue with the on premise / perpetual license model. Over a three-year period, the cloud based solution would cost the City significantly more than the premise based option. A capital project was approved 2021 to upgrade the City's current on premise service.

With the implementation of the new environment, the City realizes the following benefits:

- Oracle Enterprise remains the most powerful, highly-available, scalable database solution that supports load-balancing and active/active fail-over in the event of a disaster or interruption of database services. This means that there should be no operational impact or outage to business applications.

- Oracle Database 19c provides the most viable long-term release that allows IT to stay current with the latest bug fixes and enhancements to database security reducing the potential for hackers, viruses and ransomware attacks.

- Oracle SPARC T8 servers provide virtualization technologies that increase performance, reliability, and scalability while increasing sustainability, lowering the carbon footprint and lowering the overall cost of software licensing. The power of virtualization enables the City to operate its' many databases on a single physical server, thus significantly reducing power consumption and lowering green house gas emissions.

- Oracle SPARC T8 servers and Oracle Database 19c improves standardization and reduces time and maintenance in creating and deploying virtualized computers efficiently and consistently while lowering the total cost of ownership and reducing staff time to deploy.

This report supports Council's 2018-2022 Term Goal #1 A Safe and Resilient City and #2 A Sustainable and Environmentally Conscious City:

Enhance and protect the safety and well-being of Richmond

1.1 Future-proof and maintain city infrastructure to keep the community safe

Environmentally conscious decision-making that demonstrates leadership in implementing innovative, sustainable practices and supports the City's unique biodiversity and island ecology.

2.1. Continued leadership in addressing climate change and promoting circular economic principals.

Analysis

Oracle RAC Enterprise and Solaris SPARC Server Upgrades

Staff estimate to complete the implementation and migration of existing Production and Test databases to new Oracle software versions on new database servers by November 1, 2021.

The following project objectives and deliverables are planned for this project:

1. Replace current Solaris SPARC T5-2 servers with newer Solaris SPARC T8-1 servers

2. Implement Oracle 19c RAC Enterprise Edition on new Solaris virtualized computers (zones)

3. Migrate existing 12 Production and 80+ Test Oracle SE2 database instances to new Solaris zones running Oracle 19c Enterprise RAC

Project Objectives *Expected benefits, outcomes, improvements*	Deliverables / Success Factors *Tangible outputs used to achieve objectives*
Continued support for Fault-Tolerant Oracle Database Services	Implementation of Oracle 19c Enterprise provides high-availability and redundancy over a stretched clustered network spanning the City Hall and Works Yard data centers eliminating risk of the database being a single point of failure. This is consistent with Council Term #1 A Safe and Resilient City.
Stay current with the latest bug fixes and enhancements to database security	Implementation of Oracle 19c database release provides IT with guaranteed bug fixes and security patch updates through April 30, 2024 (Premier Support) and April 30, 2027 (Extended Support) respectively.
Increase performance, reliability and scalability	New Solaris SPARC T8 physical servers will increase performance for each production business application through the availability and utilization of more system resources (memory, disk, virtual CPUs).
Increase virtualization	Solaris zones uses virtualization technologies to maintain and run multiple application databases on virtual computers running independently of each other while sharing global hardware resources.
Reduce Environmental Impact and Increase sustainability	Through the consolidation and virtualization of Oracle database servers, IT is able to reduce environmental impact and increase sustainability, eliminating the need to purchase additional database servers in the future. This is consistent with Council Term Goal #2 A Sustainable and Environmentally Conscious City. The power of virtualization enables the City to operate its' many databases on a single physical server, thus significantly reducing power consumption and lowering green house gas emissions.
Enable application database isolation	The isolation and separation of business applications on individual zones reduces the global impact of potential outages to all Oracle systems during planned and

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	unplanned outages.
Improved Standardization	Implementation of Oracle 19c database version eliminates the need to support 5 different Oracle database versions that are currently in use at the City.

Financial Impact

The cost for implementing Oracle Enterprise RAC on new Solaris SPARC Servers is estimated to be approximately $850,000 and will be covered within existing capital project CY00058 Oracle RAC Enterprise and Solaris SPARC Server Upgrades.

Conclusion

The implementation of Oracle Enterprise RAC on new Solaris servers enables the City to continue to provide fault-tolerant Oracle database services while increasing performance, reliability and scalability to critical business applications and ensuring the City stay current with the latest bug fixes and enhancements to security.

James Teo
Database Administrator, IT Innovation and Development
(604-204-8657)

Att.1 7191NOITC – Oracle Database Software and Solaris Hardware Purchase

![City of Richmond crest] **City of Richmond**

Notice of Intent to Contract
Finance and Corporate Services Division
Purchasing Section

7191 Notice of Intent to Contract ("NOITC")
Issue date: 03/19/2021
Closing date and time: 03/30/2021 at 12:00 pm, local time.

Re: Oracle Database Software and Solaris Server Hardware Purchase

Notice is hereby given by the City of Richmond ("City") of its intent to upgrade its existing Oracle Database Standard Edition 2 (SE2) Software licenses to Oracle Enterprise Edition (EE) RAC, purchase two new Solaris SPARC T8-1 servers and acquire professional services from Eclipsys Solutions Inc. ("Eclipsys") for supplemental configuration, setup and review of the new Oracle RAC and Solaris OS environment.

Background:

The City initially implemented the Oracle Database Standard Edition 2 (SE2) Real Application Clusters (RAC) on premise solution in 2014 to address the requirements for a robust and highly available database solution that supports many critical business applications. The City currently employs two Solaris SPARC T5-2 servers that distribute Oracle database workload while providing a load-balanced and fail-over system in the event of database interruption.

The City subscribes to Oracle Corporation ("Oracle") for the on-going support of its database products through an annual Premier Support licensing model. As of January 2019, Oracle made a technology change by de-supporting RAC on Oracle SE2 effectively hampering the City's ability to continue to provide a load-balanced, highly available database solution under its currently licensed model without upgrading to Oracle Enterprise Edition (EE) RAC.

Description:

As part of this Contract, Eclipsys is required to provide a new Oracle license agreement for 6 Oracle Database EE RAC licenses that includes the conversion of 4 existing Oracle SE2 licenses including the supply of 2 new licenses to Oracle EE RAC, in addition to provisioning 2 new Oracle Solaris SPARC T8-1 servers. Eclipsys will be providing professional services to supplement the configuration and setup of Oracle RAC and Solaris OS.

Eclipsys is a Value-Added-Reseller (VAR) specializing in a niche market that includes the installation, custom configuration and support of Oracle Database RAC on Solaris SPARC servers. Eclipsys is very familiar with the City's customized IT infrastructure having recently completed an Oracle architecture review and health check of the City's existing Oracle RAC environment in 2020. Eclipsys also leveraged competitive discounts from Oracle providing the City with a cost effective, highly available Oracle Database RAC infrastructure that supports the City's mission critical applications without a major upgrade for the next several years. Eclipsys will be providing support and subject matter expertise during Oracle RAC and Solaris OS

installation and configuration. Post-implementation, Eclipsys will be providing an architecture review and assessment to confirm best practices have been followed.

For the reasons above, the City has determined it is in the best interest to contract with Eclipsys to provide Oracle Database Software Licenses and Solaris SPARC server hardware for an estimated contract value not exceeding $850,000.00 Canadian dollars, including contingency over an estimated contract term of 1 year.

Anyone requesting more information regarding this NOITC is to contact the City's Manager of Purchasing, in writing by e-mail to purchasing@richmond.ca.

Manager, Purchasing

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