

الآية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

يَرْفَعُ اللَّهُ الَّذِينَ آمَنُوا
وَأَتَوْا الْعِلْمَ دَرَجَاتٍ
وَاللَّهُ بِمَا تَعْمَلُونَ
خَبِيرٌ
صَدَقَ اللَّهُ الْعَظِيمُ

آل عمران الآية (11)

DEDICATION

To my great parents..

To my great grandmother..

To my brothers and sisters..

To my beloved wife..

With great love.

ACKNOWLEDGEMENT

I would like to take this opportunity to express about my gratitude to all people who have supported me during the progress of the research, especially to my family for their contiguous engagement.

To my supervisor Dr. Yassir Mohieddien Sabir, who suggested the idea that would become the core of my research, and his contiguous support by giving me all the equipments I needed and guiding me step by step through the stages of the research, I really regard him.

To Dr. Awad Mohammed Awad AL Kareem and Dr. Seifeddien Fettouh, for giving their own time to proof-read and critique various parts of my thesis.

To my teachers, those gave me the knowledge and disclose the ambiguous sides in my concerns, regards.

To my uncle Mohammed Farah for his considerable help. Also to Benya and Soul Engineering Companies for their helps, and allowing me their office spaces to work.

To my colleagues, those share the hardness of learning with me.

All of you have formed a pillar of strength for me throughout this research; thank you very much.

Before all of these, at first and last (Alhamdu Lillahi) very much.

المُستَخْلَصُ

إنَّ عملية الإختيل-ين- نظلمدارة قواعد البيانات للجانبة أمر ليسلسل- فإن تَبَي-
إحدى لئسُخ للجانبة للجانبة يُفَضَّلُ أن يتمالإستند-إلى مغير محدة تسلف في
هذا الإختيل-

عمدَ هذا البحث إلى تحقيق مجموعة من الأهداف هي، إجراء عملية مقارنة بين النسخ
للجانبة من نظلمدارة قواعد البيانات جي- ثين- من أكثرهنه- لنظم شيوك ووكه هما
OracleXE و Postgres، كما عمد أيضاً إلى إعطاء فكرة عن عملية التهجير/التحويل بين نظم
إدارة قواعد البيانات، وتبسيط الضوء على ال Benchmark.

لتحقيق هذه الأهداف تم إتباع المنهج الوصفي لإعطاء نبذة تعريفية عن كل واحد من المنتَجين)
Oracle و Postgres) وإجراء مقارنة نظرية بينهما. وتم إنشاء قاعدة بيانات في Oracle لإجراء
التطبيقات عليها. ومن ثم تم تهجيرها إلى Postgres، مع التركيز على الأدوات المستخدمة في
عملية التهجير وأنواع التهجير والخطوات اللازمة لإنجاز هذه العملية.

بعد ذلك تم استعراض كيفية إستخلاص معلومات عن الكفاءة في Oracle باستخدام التسهيلات
الموجودة فيه. كما تم استعراض كيفية إجراء إختبار ال Benchmark في Oracle باستخدام
برنامج مُتَخَصِّص لهذا الغرض هو Swingbench.

ثم تمت مراقبة كل من نظامي Oracle و Postgres باستخدام برنامج متخصص هو
ManageEngine واستخلاص معلومات عن الكفاءة لكل من المنتَجين. ومن ثم تمت مقارنة هذه
المعلومات لكل من Oracle و Postgres. وتم إجراء مقارنات توضيحية باستخدام المخططات
الرسمية.

أوضح هذا البحث أنه، أولاً توجد إمكانات للتهجير من نظام إدارة قواعد بيانات إلى آخر، بحيث
يُحَصَّل على الكائنات والبيانات بنسبة ضئيلة من الخطأ بعد عملية التهجير. ثانياً وفيما يتعلق
بالكفاءة فإن كلا المنتَجين يوفران حلاً مُرضياً لبعض الشيء، إلا أن Postgres - مفتوح المصدر-
يعدُّ الأكثر كفاءةً حسب التطبيق المستخدم في البحث.

تتلخَّص نتائج الدراسة في أن OracleXE يصلح لقواعد البيانات الصغيرة، كما أنه يصلح في
الحالات التي يُرغَب في أن تكون بعض الخصائص الإضافية فيها مدعومة مثل ال Materialized

View. أما Postgres فيصلح مع قواعد البيانات الضخمة التي تحتوي على كم هائل من البيانات. يوصي هذا البحث بمجموعة من المواضيع التي تتطلب المزيد من الدراسة والبحث مثل التعمُّق في دراسة الأخطاء الناتجة عن عملية التهجير، وتطوير أدوات لإجراء إختبارات الـ Benchmark في الـ Postgres.

ABSTRACT

The selection of freeware DBMS is not an easy matter, that adopting one of available versions is better to be done depending on specific criteria helps in such selection.

This research intended to achieve a number of aims those are: comparing free DBMS products through two of the most common and strongest, Oracle and Postgres. The study also intends to highlight the process of migration among DBMS products. Also to give an idea about the benchmarking.

In order to achieve these objectives, the descriptive methodology followed to give introductory definition about Oracle and Postgres, then theoretically compare them. Also sample database created to make applications on it, migrate it to Postgres concerning the tools, types and the steps to accomplish the migration process.

After that, it has been showed how the performance information extracted using the existed facilities in Oracle, also it had been showed how to perform Oracle benchmark test using professional program for this purpose, which is swingbench.

Then, both Oracle and Postgres monitored using professional program ManageEngine, and performance information extracted. Then compare the extracted performance information, and the illustrated comparisons are done using the graphical charts.

This research explained the possibilities to migrate from one DBMS to another, ensuring migrated all objects and data with least errors. In term of performance, both products provide considerable solutions, where Postgres is more efficient.

The results of this research are summarized in that, OracleXE is suitable for the small databases, also in the cases of the supported additional features (materialized view). Whereas Postgres is suitable with the large databases contain huge amount of data.

The research recommends a group of topics to be studied and researched such as studying the migration errors deeply, and to developed benchmark tools for Postgres.

LIST OF ABBREVIATIONS

ACID	Atomicity, Consistency, Isolation, Durability
ADDDMI	Automatic Database Diagnostic Monitor
ASH	Active Session History
API	Application Program Interface
ASM	Automated Storage Management
AWR	Automatic Workload Repository
BSD	Berkeley Software Distribution
DBA	Database Administration
DBMS	Database Management System
GPL	General Public License
ISAM	Indexed Sequential Access Method
JDBC	Java Database Connectivity
OCI	Oracle Call Interface
ODBC	Oracle Database Connectivity
OLTP	Online Transaction Processing
RAID	Redundant Array of Inexpensive Disks
RBAC	Rule Base Access Control
RDB	Relational Database
SQL	Structured Query Language

LIST OF FIGURES

Figure No	Figure Name	Page No
2.1	PostgreSQL architecture.....	10
3.1	Oracle objects migrated with EnterpriseDB Migration Studio.....	14
3.2	Migration Tools.....	15
3.3	Migration Studio, migration modes.....	26
3.4	Offline Migration.....	27
3.5	Online migration dialog box.....	29
3.6	Connection to an instance of Advanced Server is not established.....	33
4.1	RDBMS's Maximum DB Sizes in Gigabyte.....	45
4.2	RDBMS's Maximum Table Sizes in Gigabyte.....	45
4.3	RDBMS's Maximum row Sizes in Kilobyte.....	46
4.4	RDBMS's Maximum Number of Columns per Row.....	46
4.5	RDBMS's Maximum Columns Name Sizes in Characters.....	47
4.6	RDBMS's Maximum BLOB/CLOB Sizes.....	48
4.7	RDBMS's Maximum CHAR Sizes.....	48
4.8	RDBMS's Maximum NUMBER Sizes.....	49
4.9	RDBMS's Minimum Date Value	49
4.10	RDBMS's Maximum Date Value	50
5.1	Migrated object in Postgres environment.....	61
5.2	pgAdmin, Analyze.....	65
5.3	Application Manager, Monitor Group.....	66
5.4	ManageEngine Application Manager Splash Screen.....	67
5.5	ManageEngine Application Manager Logon Interface.....	67
5.6	Available Servers to be Monitored in ManageEngine.....	68
5.7	Create New Monitor in ManageEngine.....	68
5.8	Create Oracle Monitor into KhalidGroup in ManageEngine.....	69
5.9	Create PostgreSQL Monitor into KhalidGroup in ManageEngine.....	69
5.10	KhalidGroup Monitor Group and its Monitors in ManageEngine.....	70
5.11	Getting Report of KhalidGroup Monitor Group in ManageEngine.....	70
5.12	Report of Oracle Monitor from ManageEngine.....	71
5.13	Report of Postgres Monitor from ManageEngine.....	71
5.14	Connection Report of Oracle Monitor from ManageEngine.....	72
5.15	Connection Report of Postgres Monitor from ManageEngine.....	72
5.16	CPU time consumption.....	75
5.17	Time consumption sharing with other application.....	75
5.18	Memory consumption.....	76
5.19	I/O Read Times.....	76
5.20	Read Bytes.....	77
5.21	Write times.....	77
5.22	Written Bytes.....	78
5.23	Oracle Results Summarization.....	79

5.24	PostgreSQL Results Summarization.....	79
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LIST OF TABLES

Table No	Table Name	Page No
1.1	The conventions used in the research.....	5
2.1	Free commercial database limitations.....	11
3.1	Migration Functionality Comparison.....	16
4.1	RDBMSs' maintainer, release dates and licenses.....	39
4.2	RDBMSs' operating system support.....	42
4.3	RDBMSs' fundamental features.....	43
4.4	RDBMSs' objects' sizes limits.....	44
4.5	RDBMSs' data-types' sizes limits.....	47
4.6	RDBMSs' table and view support.....	50
4.7	RDBMSs' indexes view support.....	51
4.8	RDBMSs' database capability.....	52
4.9	Some RDBMSs' objects availability.....	53
4.10	Partitioning methods those RDBMSs' support.....	53
4.11	Access controls supported by RDBMSs'.....	54
5.1	Oracle Performance Information.....	73
5.2	Postgres Performance Information.....	73
5.3	RDBMSs' Performance Information.....	74

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION

1.1 Background	1
1.2 Motivation	1
1.3 Problem Definition.....	2
1.4 Research Objectives	3
1.5 Scope and Assumptions.....	3
1.6 Methodology	4
1.7 How this Research Organized	4
1.8 Conventions.....	5

CHAPTER 2: SOFTWARE PROCESS AND AGILE OVERVIEW

2.1 Introduction	6
2.2 Oracle Database Overview.....	6
2.2.1 Administrating an Oracle Database.....	6
2.2.1.1 Types of Oracle Database Users.....	6
2.2.1.2 Oracle Database Administrators	7
2.2.2 Oracle XE Database.....	7
2.3 PostgreSQL Overview.....	7
2.3.1 Essence of PostgreSQL.....	8
2.3.2 A Short History of PostgreSQL.....	8
2.3.3 PostgreSQL Features.....	9
2.3.4 PostgreSQL Architecture.....	9
2.3.5 Data Access with PostgreSQL.....	10
2.3.6 Restrictions of Postgres and Commercial DBMS Products.....	11
2.3.6.1 Limitations of Commercial DBMS Products.....	11
2.3.6.2 Limitations of PostgreSQL.....	12

CHAPTER 3: MIGRATION

3.1 Introduction	13
3.2 Migration Tools.....	13
3.3 Migration Methodology.....	17
3.3.1 The Migration Process	17
3.3.2 Connecting an Application to Advanced Server.....	19
3.3.3 An Oracle Migration Steps.....	19
3.3.3.1 Migration Preparation.....	20
3.3.3.2 Migration Execution.....	22
3.3.3.3 Migration Validation.....	24
3.3.3.4 Migration Testing.....	25
3.3.3.5 Tuning the Migrated System.....	25
3.4 Online vs. Offline Migration.....	26
3.5 Offline Migration.....	27
3.6 Online Migration.....	29
3.7 The Migration Summary.....	31
3.8 Post Migration.....	32

3.8.1 Migration Studio Connection Errors.....	33
3.8.2 Migration Studio Migration Errors.....	33
3.8.3 Unsupported Oracle Features.....	36
3.9 Summary.....	37
CHAPTER 4: THEORETICAL COMPARISON	
4.1 Introduction	39
4.2 Features of Oracle.....	39
4.3 Features of PostgreSQL	40
4.4 Oracle vs. PostgreSQL.....	41
4.4.1 Operating System Support.....	42
4.4.2 Fundamental Features.....	43
4.4.3 Limits.....	43
4.4.3.1 Objects' Limits.....	44
4.4.3.2 Some Data-Types' Limits.....	47
4.4.4 Tables and Views.....	50
4.4.5 Indexes.....	51
4.4.6 Database Capabilities.....	52
4.4.7 Some Objects Support.....	52
4.4.8 Partitioning.....	53
4.4.9 Access Control.....	54
CHAPTER 5: PERFORMANCE TESTS AND ANALYSIS AND VISUALIZATION OF THE RESULTS	
5.1 Testing Oracle Performance	55
5.1.1 Tracing	55
5.1.2 TKPROF.....	57
5.1.3 Using Trace Facility and TKPROF.....	57
5.1.4 Oracle AWR.....	59
5.1.5 Oracle Benchmark Tests.....	60
5.2 The Database in PostgreSQL.....	61
5.3 Hits on PostgreSQL Performance Tuning.....	61
5.3.1 Hardware Considerations.....	62
5.3.2 Tuning SQL Code.....	62
5.3.3 PostgreSQL Explain Analyze.....	64
5.3.4 PostgreSQL pgbench Tool.....	65
5.4 ManageEngine Application Manager.....	66
5.4.1 Oracle Performance Statistics.....	73
5.4.2 PostgreSQL Performance Statistics	73
5.5 Comparison of Oracle and PostgreSQL Performance	74
5.5.1 Analysis and Visualization of the Results.....	74
5.5.2 The Results Summarization.....	78
CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS	
6.1 Preface.....	80
6.2 Conclusions.....	80
6.3 Results Discussion.....	81
6.4 Recommendations.....	81
6.5 Limitations.....	82

6.6 Learned Lessons.....	82
REFERENCES	83
APPENDICES	
Appendix A: Oracle database creation.....	i
Appendix B: The Migration.....	v
Appendix C: Oracle AWR.....	xxi
Appendix D: Oracle Benchmark Test.....	xxx