Practical Oracle Database Appliance

Bobby Curtis
Fuad Arshad
Erik Benner
Maris Elsins
Matt Gallagher
Pete Sharman
Yury Velikanov

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Foreword

How did the Oracle Database Appliance (ODA) come into being? That's a good question, and I'd like to share some of the history, motivation, and thought-process behind the appliance's creation.

We in the the Real Application Clusters (RAC) development group at Oracle were striving to make RAC a more broadly adopted technology. Oracle RAC saw rapid adoption and growth in its first decade (2001 through 2011) in the market, but many mid-market customers were avoiding RAC for reasons of perceived complexity and cost. While RAC was common and accepted in large, enterprise environments, Oracle's mid-market customers did not have a simple and affordable RAC database solution.

In early 2010, Oracle acquired Sun Microsystems and a new world of possibilities opened up. Sun had a Cluster-in-a-Box hardware system that wasn't yet commercially available. It had server, storage, and networking in an attractive, 4U-size form factor. That system proved to be the simplest way to deploy RAC. Using it, we were able to deploy RAC in 55 minutes!

On went the light bulbs. This Cluster-in-a-Box was truly the answer to our "RAC for the Masses" dream. We developed the Appliance Manager software to simplify and automate deployment, patching, and storage management. That software together with the appliance made RAC implementation dead-simple. And that is how the ODA was born.

Our next challenge was cost. What's the use of inexpensive hardware if software costs break the bank? This is the challenge that we had to overcome in order to make our RAC-in-a-Box solution attractive to mid-market customers. Could cluster hardware and RAC database software be purchased and deployed for under $100,000? With the support of Oracle's executive management, the ODA became Oracle's first, capacity-on-demand system. In other words, customers could buy in at a low price, and then turn on more cores and add license features as their needs grew. That approach is what made sub-$100,000 Oracle RAC systems a real possibility.

Early customers raved about the simplicity of the ODA. Many RAC skeptics were converted. Several customers adopted ODA as a standard. But like it usually happens, customers soon wanted more! With each generation of ODA, the CPU, memory, and storage capacities grew. Customers wanted to also put their applications inside the ODA. And that's why we built the ODA Virtualized Platform. The database could run in its own virtual machine (VM), and customer applications could run in their own VMs. Customers could pay for what they used at each tier, with full application and database isolation security. Hence the concept of a Solution-in-a-Box was born. People started thinking of the ODA as a modern-day AS/400.

Fuad Arshad is one of the authors on this book, and it is my pleasure to say a few words about him. I first met Fuad when he was my customer. It was one afternoon in which Fuad deployed four ODAs end-to-end, and had Oracle RAC running on all of them. He literally couldn't believe it. He understood that he had just accomplished in one afternoon what his organization had previously taken months to do. He understood that this was a paradigm shift in deploying Oracle and RAC. For him and his organization, it changed the game, and the requests kept pouring in to him: "Can I have an ODA, please?".

Fuad and his team mates followed ODA with a fever that I have rarely seen among customers. Fuad quickly became one of the most knowledgeable people on the technology and our most valuable customer-feedback asset. He tested everything relating to ODA. He blogged about it. He spoke at user conferences. Fuad's fever has driven him to write about a subject for which he oozes passion. And that is true of his coauthors too. I wish them well, and every success with their book.

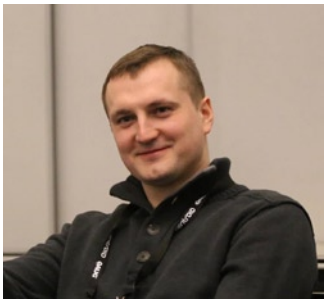
—Sohan DeMel
Vice President, Product Strategy and Business Development
Oracle Corporation

About the Authors

Bobby L. Curtis, MBA, has spent 18 years in information technology, 12 of which he has been using Oracle products. He specializes in database monitoring and data integration technologies, both aimed at making usability simpler and easier. Currently, he is working as a senior technical consultant focused on implementations and migrations of scalable databases while providing monitoring solutions for these environments. Bobby is a member of the Independent Oracle User Group (IOUG), the Oracle Development Tools User Group (ODTUG), the Georgia Oracle User Group (GOUSER), and the Rocky Mountains Oracle User Group (RMOUG). He lives with his wife and three kids in Douglasville, GA. Bobby is honing his technical skills at Enkitec (`www.enkitec.com`). He can be followed on Twitter at `@dbasolved` and his blog at `http://dbasolved.com`.

Fuad Arshad is a senior database architect who has worked with Oracle Database technologies for more than 16 years. He has experience in all aspects of Oracle Database, from management to tuning, and he is an Oracle Certified Expert. He frequently blogs about Oracle at `http://www.fuadarshad.com`. Fuad participates in online forums and social media. He is an active Twitter user, and you can find him there at `http://www.twitter.com/fuadar`. Fuad has presented at conferences such as Collaborate and Oracle OpenWorld on topics ranging from Oracle Real Application Clusters to Oracle Database Appliance. Fuad currently works for Oracle Corporation in its North American Sales organization. He is husband to Saba, and Father to Areej and Ammaar, whom he tries to spend all of his non Oracle related time with.

Erik Benner is a solution architect with BIAS Corp., where he focuses on solutions that meet the customers' business needs. Erik worked with the Oracle Database Appliance prior to its official release, and continues to discover new ways to leverage the technology as not only a database server, but also as an application system when virtualized. Erik is a common speaker at Oracle events, focusing on the areas of Oracle Database Appliance, Linux, and virtualization. When not working, Erik enjoys spending time with his family at their observatory, where the telescopes outnumber the people.



Maris Elsins is an experienced Oracle Applications DBA currently working as team technical lead at The Pythian Group. His main areas of expertise are troubleshooting and performance tuning of Oracle Database and e-Business Suite systems. Maris has led or taken part in numerous Oracle e-Business Suite implementation, maintenance, migration, and upgrade projects. He is a blogger and a frequent speaker at Oracle-related conferences such as UKOUG, Collaborate, and others. Maris is an Oracle Certified Master and a holder of several Oracle Certified Professional certificates. He's also a member of the board of the Latvian Oracle User Group.

Matt Gallagher is a lead database architect at a major Fortune 500 company. He has 17 years of Oracle experience. He specializes in developing enterprise-class database administration and architecture solutions. Matt's experience includes the Oracle Database Appliance, Exadata, Oracle RAC, Data Guard, and ASM. He has developed solutions for all types of database requirements, including high-availability, transactional, and decision support systems.

Pete Sharman is a principal product manager with the Enterprise Manager product suite group in the Server Technologies Division at Oracle Corporation. He has worked with Oracle for the past 18 years in a variety of roles, from education to consulting to development, and has used Enterprise Manager since its 0.76 beta release. Pete is a member of the OakTable Network and has presented at conferences around the world, including Oracle OpenWorld (both in Australia and the United States), RMOUG Training Days, the Hotsos Conference, Miracle Open World, and the AUSOUG and NZOUG conferences. He has authored a book on how to pass the Oracle8i Database Administration exam for the Oracle Certified Professional program. He lives in Canberra, Australia, with his wife and three children.

Yury Velikanov has more than 15 years of Oracle DBA experience. He is an Oracle Certified Master in 9i/10h/11g versions. For his involvement in the Oracle community, he has been recognized as an Oracle ACE Director. During the last few years, Yury has been involved in Oracle Database Appliance projects. He happily shares his experience with you in this book.

About the Technical Reviewer

Frits Hoogland is an IT professional specializing in Oracle database performance and internals. Frits frequently presents on Oracle technical topics at conferences around the world. In 2009, he received an Oracle ACE award from the Oracle Technology Network, and a year later became an Oracle ACE Director. In 2010, he joined the OakTable Network. In addition to developing his Oracle expertise, Frits works with MySQL, PostgreSQL, and modern operating systems. Frits currently works at Enkitec LP.

Acknowledgments

Special thanks to all of my friends and family who have supported me in this endeavor; especially my wife, Patty, and my children, Brendan, Patrick, and Addison. Love you guys!

—Bobby Curtis

Writing the acknowledgements is probably the hardest part of the book, This is part of the sheer amount of people that helped in the book and my fear that I will miss some of them in the process. I will however start with my family abd the tremendous support that I got from my Wife Saba and my two kids Areej and Ammaar who knew this was time I was taking away from them to focus on the book. I also want to acknowledge the whole Database Appliance team at Oracle, including but not limited to Sohan Demel, Ian Cookson, Sanjay Singh, Duane Smith, Ravi Sharma. The support I got from the whole ODA organization as we were trying to get the ODA off the ground and running was tremendous. I would like to like to put praise for Brian Bong, Brice Lahl, Jesse Hogan, Qin Huang and one of the my co-authors for the book Matthew Gallagher for the tremendous support system we built and the risks we took to make this a success. The Apress team including Jonathan Gennick , Anamika and Kimberly for putting us in the right path and helping us get thru the perils of writing a book. Last and not least the other co-authors for working as a team and getting it done. It was truly a pleasure working with all of them.

—Fuad Arshad

Thanks to my family for the patience and support that made this possible.

—Maris Elsins

I would like to thank Jonathan Gennick, the staff at Apress, Bobby Curtis, and Fuad Arshad for giving me the opportunity to work with them on this book project. It's been a great experience.

—Matthew Gallagher

I appreciate all the help received from Apress and the authors that collaborated on this book. I would like to say huge thanks to my lovely wife, Karina, and sons Max and Nik, who supported me a lot along the way. Without you I would have never made it.

—Yury Velikanov

Introduction

The world of information technology has changed rapidly since the inception of computers during the '60s and '70s. These changes have helped propel many different aspects of our economy to include what and how businesses conduct daily operations. With these changes to organizations, especially internally with information technology, faster and better ways of achieving business goals have been pushed and developed.

As businesses start to depend more on data stored within their systems, faster ways of processing and reporting data have developed. Over time, organizations have asked for ways to improve processing, achieve greater throughput, and report more quickly. This eventually led to the development of systems that could leverage both software and hardware resources together, leading to the development of engineered systems.

After the development of engineered systems, such as the Exadata, many organizations were left with a difficult choice of either a massive expense for an engineered system (Exadata) or to build their own. This decision affects a large number of small- to medium-sized businesses. Oracle recognized this, leading to the birth of the Oracle Database Appliance.

What Is the Oracle Database Appliance?

At a high level, the Oracle Database Appliance is a server and storage and network hardware, combined with network, cluster, and database software and templates. The Oracle Database Appliance is a fully supported, integrated system consisting of hardware and software components. Being that it is an integrated system, it is engineered to work at both the software and hardware layers, is simple to configure and maintain, and preconfigured to work with database workloads. Additionally, it is designed to help organizations minimize costs, increase adoption time, and lower risk in database deployment and maintenance.

How This Book Came to Be Written

The authors of this book have been in the information technology industry for many years. In that time, we have seen and dealt with many different platforms across a wide range of applications and databases. During this time, however, we have not seen a compact, engineered system that can be a benefit to organizations more than the Oracle Database Appliance. The idea for this book came about while many of us were implementing Oracle Database Appliances for a variety of customers. As we implemented the Oracle Database Appliance in various environments, we would run into a problem or two and realized there was not a single complete body of work for this appliance. Sure, there were Oracle documents, but at some level, finding information was a challenge. At that moment we realized, when there were issues, surely we were not the only ones hitting them. The desire to write this book grew even more when all of us met at a conference and began talking about issues with the Oracle Database Appliance. We all agreed that the industry needed a book about this complex yet simple engineered system. All of the authors of this book had a desire to share our knowledge, which we have gained from using the Oracle Database Appliance. Hence, the need for this book was kicked into motion!

Why Buy This Book

If you are a DBA or a manager who deals with databases on a regular basis, this book is going to provide you with information on using the Oracle Database Appliance. No matter how complex an environment your organization has, you will be able to use the information in this book to bring the Oracle Database Appliance, throughout its life cycle, within your organization.

An understanding of what the Oracle Database Appliance can do will radically improve your ability to quickly implement complex solutions, while ensuring rapid deployments of databases. At the same time, you will develop ideas on how to uniquely use this appliance when moving from homegrown solutions to out-of-the-box solutions.