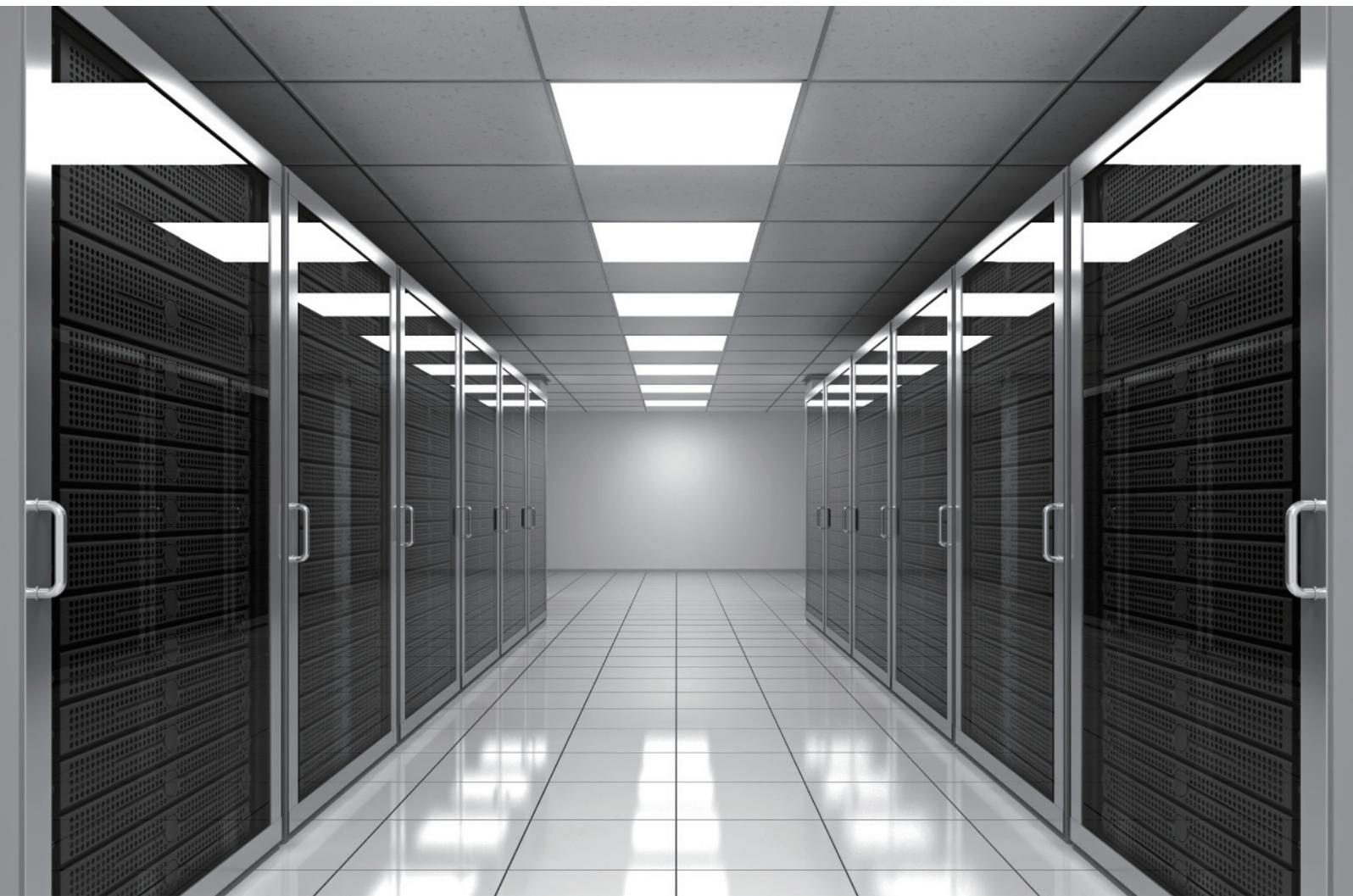# Installing Oracle DBA 1.0

Insights Into the Acquisition of the Basic DBA Skill Set

Harald van Breederode and Joel Goodman

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Introduction

In 2008 we published a booklet discussing the skill-set required by many modern DBAs which we called "Upgrading from Oracle DBA 1.0 to DBA 2.0". We discussed some of the shifts in Oracle technology and the need for Oracle DBAs to move with the times by learning new skills previously thought to have been exclusively for administration of operating systems, storage systems or networks. The booklet was intended as a guide for experienced Oracle DBAs, but did not address basic skills required by entry level DBAs.

We both began our Oracle DBA careers by switching to Oracle from other technology areas and we have been discussing how we did this, what skills were required or useful or both, and the milestones that we set for ourselves along the way.

Installing Oracle DBA 1.0

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Insights into the Acquisition of the Basic DBA Skill-Set

Harald

My first exposure to Oracle Databases was while working in the Dutch Oracle data centre between 1993 and 1998 as a Unix systems administrator. In that role, I looked after many Unix systems that ran Oracle 6 and Oracle 7, but I knew virtually nothing about Oracle technology at the time. In 1999 I joined Oracle University taking responsibility for Unix servers that were used to host Oracle University core technology courses. As part of my role, I inherited the "precourse" scripts that built Oracle courses in the classroom.

At this time I began to attain some basic Oracle DBA skills required to create and maintain the classroom set-ups, but I realised straight away that Oracle was a complex piece of technology. As I already had useful OS, storage, and network administrator skills, I was able to learn Oracle fairly quickly by a combination of self-study and course attendance.

Joel, how did you get started?

Joel

I was on a sabbatical year in 1993 and 1994, having spent 18 years in the industry as a specialist in Mainframe technology, including seven years as a trainer. It seemed like a good idea to upgrade my skills to more modern technology. I therefore joined Oracle Customer Support to help customers running Oracle on mainframes, but my goal was always to learn enough so that I could return to my favourite work as a trainer.

Unlike you, I required more new skills at the time, as it was a big change moving from the mainframe support role (at the start) to a generic DBA role. I then supported many customers who ran Oracle on IBM MVS and VM, but the trend toward Unix was already clear, as was the need to attain some basic VMS and Unix skills required at the time to install and administer Oracle databases.

Which skills did you acquire first when learning to be an Oracle DBA?

Harald

The first and most important skills I acquired were practical ones needed to work in the data centre, such as software installation, database creation, instance startup and shutdown, backup and recovery and some diagnostics using the alert log and trace files. To help me do this, I attended the basic SQL course and the DBA Admin course for Oracle at the time. This helped me understand the introductory skills needed for Oracle Database Administration, as well as the basic architecture of the Oracle background processes and memory structures, which was much simpler in those days.

Joel

It is not surprising that you began with more of an 'operational' skill-set, given that you needed to maintain and develop the "pre-course" scripts, which performed many of these actions.

Harald

Yes, that is true - but the technology was still somewhat of a "black box" to me until I got motivated to learn it properly. I was asked to fill in for another trainer and deliver a "Managing Oracle on Unix" course, and realised how little I knew about architectural details when I examined the course notes. It was this course that really motivated me to move beyond the 'operational' skills and to become a proper DBA 1.0.

You were already well known as an Oracle trainer in those days, but when you started - how did you decide which skills to learn first?

Joel

As a member of Oracle support I was required to handle service requests on any or all database topics when working on level-1 support. In those days I was new so I worked on level-1 calls, while the more experienced support engineers handled level-2 for calls that level-1 people could not close quickly. So I was exposed to a wide range of Oracle DBA bugs and problems. This was a very useful learning environment, as the problems I handled ranged across many areas including: installation, configuration, backup and recovery, monitoring and tuning, the optimiser and several others. But I handled things only when the customer had 'problems', so my skills were heavily focused on diagnostics, traces, alert logs, and the use of many undocumented features and support tools. My knowledge of the architecture was gained from a few courses that I attended in the first few weeks of the job and also from managing many customer calls and examining the alert logs and traces that were used to aid the diagnosis.

Harald

It sounds like a very different approach than mine since you learned much of your skills from the 'inside-out' compared to the 'outside-in' approach that I took from the operating system into Oracle. You knew about internals, traces, memory structures and other low level processing, but I began with data files, processes, some memory structures and other higher-level components. Of course developers have also got an 'outside-in' path starting from the programming interfaces to Oracle rather than from the OS - but this shows that prospective DBAs have several possible entry points into a career in Oracle DBA technology. There is no such thing as "The Best Way" to get started or to learn Oracle.

Joel

Yes, this certainly reflects the different paths upon which Oracle DBAs travel in becoming a DBA. Many DBAs that I have taught over the years began their Information Technology careers in computer operations, and to them Oracle was also a "black box". Some of my delegates began in development writing SQL and PL/SQL, and moved into the DBA skill-set first by becoming a "Development DBA" and then a "Production DBA". Some DBAs are trained as DBAs from the start and like myself - may have learned from the 'inside-out.'

Harald

It sounds to me as if the 'inside-out' approach might be a very good method since one gets a real in-depth understanding of the technology as compared to the 'outside-in' approach. I was writing and maintaining a suite of automated shell and perl scripts to clone databases and set up accounts for students on courses, but at the start - I had little idea of what was happening inside the Oracle kernel. In some cases, it took me quite some time to figure out how Oracle worked and why certain parts of the system did what they did.

Joel

The 'outside-in' approach has advantages and disadvantages. I knew a very great deal about those parts of the Oracle database and the kernel for which I had experience in handling customer calls, producing reproducible cases, raising bug reports and related activities that one performs in support. But there were areas of Oracle database about which I knew little or nothing because I did not have experience in those areas.

For example, after nearly two years in support I knew Database Links and Heterogeneous Service Agents (then called Transparent Gateways) in depth, but had no skills in (what was then known as) Parallel Server or in Parallel Query as I did not have an opportunity to work on problems in those areas.

In summary: DBAs who use this approach often have an incomplete and unbalanced skill-set and may be lacking skills in fundamental areas.

Harald

We have discussed the fundamental approaches to learning Oracle and perhaps other technology as well, but new DBAs may wish to know of any learning tricks and tips we can share. The Oracle database is a much larger product now than when we began and it is crucial to help prospective DBAs to focus on the most important skills and the techniques that assist learning.

When I started learning Oracle database technology you were already known in the DBA training community as an expert and I recall attending some Oracle 8i Internals seminars that you gave in the Netherlands. How did you gain this expertise to teach internals in a relatively short time after leaving support with the incomplete skill-set to which you referred?

Joel

I left support and joined Oracle University in 1997 once I had enough confidence in my basic skills to return to training. My role required that I deliver the Oracle Database Tuning course and also the full range of basic courses available at the time. There were only two advanced courses in those days: Parallel Server – which was the Clustered Database product prior to RAC, and Replication – and my goal was to teach them as well. This requirement to teach others is what gave me the proper motivation to learn Oracle technology to a sufficient depth. I used various techniques to help me learn quickly having used these in my earlier career to the same effect.

Harald

That is indeed useful information, and reinforces what I said earlier about 'teaching as the best way to learn'. Teaching and learning are really part of the same process and we both seem to agree on that, despite becoming Oracle trainers from different backgrounds and using different approaches.

I became a full-time Oracle Trainer in 2000 and used a similar all-around approach. By learning all the courses I attained a broad skill-set, and by writing demos and researching topics I further deepened my skills.

But you had some very deep skills from the start, having got them in support… how did they help you as a trainer?

Joel

Some of the skills that I used in support were not that important at first, such as using undocumented features to work around problems and bugs. But I was missing other skills as I mentioned.

On my first day, I asked for copies of all the DBA courses - even though the expectation was that I should teach only some of them at first. It took a long time to read all those courses, but this was not that dissimilar to reading several of the high-level books in the documentation set such as the various concepts guides. At the same time - I used a sandbox system to practice many of the skills that I was missing, and I improved as a result. My teaching philosophy was (and still is) that "it is sometimes OK if one does not know the answer, but it is always crucial to understand the question".

Learning all of the technology and having lots of collateral knowledge helped me to become an expert in DBA 1.0 and to understand those questions. And if I did not have an answer, then I would research it and thereby succeed in learning something new, which is another example of how 'teaching and learning' are parts of the same process.

Harald

I agree that playing with the system is very important. I write many demo scripts to help me teach courses and I treat these scripts as mini-projects, which give me a set of requirements requiring a solution. I find it easier to teach

myself when I have a realistic requirement and a structure, rather than by randomly playing with the system.

Joel

Demos are an excellent technique for learning, and I too write demos to help learn as well as to teach. I also maintain them as time goes by if new features are added that are relevant to the demos, or if I learn something of which I was unaware. I also read articles and blogs and volunteer to speak at various user group meetings. By researching topics for my blog posts or presentations, I learn a great deal in-depth about new topics. And when I attend the special interest group (SIG) meetings, I also learn a great deal from the other speakers.

How about you? Aside from demos, what do you do to help you learn?

Harald

Like you, I read what others have published and speak and attend user group meetings. But it is not always possible for DBAs to do so, due to travel restrictions or difficulty getting away from the office. I get around this by writing articles and more recently by blogging - both of which also require research and help to learn the chosen topic in more in-depth. I also cannot overemphasise the importance of hard work - whether it is research or demos or articles. Oracle database is a large complex product and the desire to succeed will motivate people to do the work. I'm sure you have worked very hard to get the expertise you had even before you added the DBA 2.0 skills to your skill-set.

Joel

Yes, many hours reading, writing demos, and creating presentations helped. But amongst the most important techniques for me was (and is) "teaching". We have discussed this many times and both agree on its importance (not necessarily in a formal classroom setting) although there have been many years of that. Sometimes it is mentoring a colleague, and sometimes just an informal discussion where I explain concepts and technical details to others. This is especially useful for recently acquired knowledge, but can be done for anything.

If for example, I wish to learn about "Locally Managed" Tablespaces then explaining this to a DBA requires that I learn about the "UNIFORM SIZE" option, the "AUTOALLOCATE" option and the conversion of "Dictionary Managed Tablespaces" into "Locally Managed" ones using the "DBMS_SPACE_ADMIN.TABLESPACE_MIGRATE_TO_LOCAL" procedure. This then allows me to teach others on all three possible local management techniques and their implications for performance. But I must also learn the best way to explain all the differences as people are bound to ask questions and this is what provides the extra depth to the skill.

Harald

I agree totally. When I began as a trainer I already knew that the knowledge and skill I already had only went so far; but to explain Oracle to others required more breadth and more depth. In effect - teaching what you know forces you to gain a far deeper understanding of the technology than is needed simply to understand it for yourself. You realised this when you left support and became an Oracle trainer, but I had already found this to be true as a Unix administrator when I explained things to help my colleagues. And my manager at the time encouraged me to become a trainer because she said that I had the ability to explain concepts well. What she perhaps did not realise was that explaining to others was also increasing the depth of my own knowledge. So my advice to all new DBAs is to (1) learn, and then (2) help your colleagues by teaching them what you know in exchange for them teaching you what they know.

Joel

And this leads me to another very important learning technique that I have used for twelve years now, which is

preparing for the Oracle Certification exams. They provide a structure for learning by listing the skill-sets required of DBAs to attain Oracle Certified Associate (OCA), Oracle Certified Professional (OCP), Oracle Certified Expert (OCE) and Oracle Certified Master (OCM) levels. I always recommend that new DBAs do the OCA exam, which covers the basic or entry level skill-set for DBAs such as installation, network administration, parameter file management, startup, shutdown, database backup, complete database recovery, users, roles, patching, data movement and some basic monitoring.

Harald

I achieved Oracle Certification both to provide the structure you mentioned, as well as to measure my skills against a known standard. It is possible to do the OCA and OCP together on the same day if one wishes, but it is probably a better idea for new DBAs to consolidate their entry-level skills before attempting the OCP exam. Nonetheless - all DBAs will benefit from the Oracle Certification structure, because essentially it is a template for the Oracle DBA job role that defines the skills required for the job.

Joel

Yes the OCP certification is the next stage, which completes the DBA 1.0 basic skill-set and covers automatic storage management, in-depth RMAN, Oracle security, flashback technology, database diagnostics, performance tuning, resource manager, job scheduler and globalisation. Some DBAs have the experience and skill already and do indeed sit both exams at once, but each DBA should complete these at their own pace when they are using the exam structure as an aid to learning.

You must have been very pleased to achieve your Oracle Certified Professional certification and to know that you now qualified to this accepted standard.

Harald

I was indeed pleased, but the best feeling came from earning my Oracle Certified Masters credentials. Although not required for DBA 1.0 entry-level skills, preparation for the OCM provides a great structure for learning advanced DBA 1.0 Skills in installation, backup and recovery, monitoring, tuning, data warehouse administration and high availability with RAC and Data Guard. And some of the RAC skills help DBAs begin on the road to DBA 2.0 skills, making this a great bridge between DBA 1.0 and DBA 2.0 skill-sets.

Joel

Now that we have covered the different paths we took into the world of training and the methods we use to teach ourselves, perhaps we can discuss the DBA 1.0 skill-set and how a new DBA should prioritise learning these skills.

Harald

This depends to some extent on the specific DBA job description for that person and whether or not Oracle Certification is used as a structural template. Typical production DBAs start by learning the basics of installation, startup and shutdown, managing users and roles, creating tablespaces, datafiles, redo log groups and members and most importantly - backup and recovery. Of those, I would start with the installer and then learn about tablespaces, log groups and users. I would then move on to backup and recovery. But some DBAs work as development 'architects' and help developers design robust physical models to assure good performance. These DBAs may prefer to learn about schema design, tables and indexes, sequences, partitioning, materialised views and other schemas object options once they have mastered installation, users, startup and shutdown.

Joel

I would also recommend that new DBAs work with senior colleagues who can mentor them. Many senior DBAs may feel that time is precious, but mentoring is also a type of teaching and this 'one-to-one' approach will benefit both parties for the reasons that we stated earlier. I mentor many people in Oracle University, and I learn much from those sessions when answering questions - even if only to learn a better way of explaining the topic we are discussing.

Harald

And one last word of advice: there is no 'one way' or 'one proper order' to learn the technology. To some extent - each person will have topics that they find more interesting and learn those earlier, and each company for which one may work will have different priorities for certain skills.

For example, a company that automates Oracle Database utilities and operations may require that new DBAs learn some shell scripting and create or support scripts for silent installation, automated database cloning, or backup scripts. Other companies may use Grid Control and require DBAs to learn how to administer that product at the same time as they learn their basic DBA skills.

Joel

And remember some people learn too from reading books, whilst others prefer attending courses. The key is to 'know what it is that you must learn,' and then use the best technique and the best skills template to match up to your requirements. I then recommend a blended approach of learning, consolidation, and teaching others (what one has just learned) to reinforce this knowledge.

Harald

For me, the learning and teaching is both a 'means to an end' as well as an end in itself, because learning is fun and rewarding. I learned many things from you in the early days of my DBA 1.0 education, and you have learned from me for your DBA 2.0 education – but in working together we have attained a better understanding. Let's hope that other new and prospective DBAs will have the same opportunities and enjoy it as much as we have.

Conclusion

To conclude, we strongly recommend a combination of learning and teaching to provide depth to DBA skills, and recommend that DBAs have a plan for acquiring their skills based on their company job requirements as well as their own interest. As Oracle DBA trainers, we have used the Oracle Certification Program for skills templates and wish success to other new DBAs in their career.

About the Authors:

Joel Goodman of Oracle University UK and EMEA, has taught Oracle DBA technology for 12 years after 2 years in support and 20 years in Mainframe OS technology. He has presented courses and seminars for Oracle University as well as speaking at the UK Oracle User Group (UK-OUG) Annual Conference, the UKOUG and other technical SIGs, and the Oracle RAC SIG in the US. He is also the Global Team leader of the Oracle DBA certification exam development team.

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