The Role of a DBA

Some of the usual questions that come up in this course is in regards to the position of a DBA. How does one become one? What skills are necessary? Is it the right direction for my career? To answer those questions, we must first have a good of idea of what role does a DBA server in an enterprise and what is asked of them. Then we will identify how one becomes a DBA.

In day to day operations of an enterprise database, there must be an individual or group of individuals assigned to assure the performance and stability of a database, as well as manage its many aspects. These group of people, known as Database Administrators (abbreviated as DBA) are responsible for the most precious asset of an enterprise, its data. Even after a database managements system is setup, there are problems that may arise during day to day operations. Managing disk space, adjusting user security and recovering lost data are just some of the issues that need to be resolved by a database administrator.

To manage these problems, companies appoint a DBA to manage both the database and the use of the database. In this chapter eight, we'll be focusing on the role of the DBA in an enterprise environment. We will learn about the DBA's role in formulating and enforcing important policies with respect to the database and its use. In addition, we will examine the DBA's other administrative responsibilities for selecting and evaluating a Database Package, the daily maintenance of the database, data dictionary management and training. We will also see the responsibility that falls on the DBA with regards to database design, testing, and performance tuning.

First, we want to highlight what are the responsibilities of a DBA. The responsibilities of a DBA include but are not limited to:

- Database Policy Formulation and Enforcement
    - Create the rules of how users access the database and make sure they follow those rules.
- Access privileges

- o Deciding what type of access do users have to particular database objects (tables, views, SPs) etc.
- Security
  - o Understanding and creating a secured database environment to determine which users can log into the database.
- Disaster planning
  - o Create the necessary processes to backup and restore data in the case of a disaster which incapacitates the production database.
- Archiving
  - o Establish a process to maintain data that is no longer needed but needs to be retained for historical or legislative purpose.
- Other Database Administrative Functions
  - o Any admin tasks needed to keep the database operational.
- DBMS evaluation and selection
  - o Performing the research of which database best fits the organization's needs when creating a new DB.
- DBMS maintenance
  - o Per maintenance duties which affect the database's performance, such as rebuilding indexes or truncating log files.
- Data dictionary management
  - o Maintain and updated data dictionary which can be used to understand the entities in the database.
- Training
  - o Creating the necessary training sessions for users who need to work with you database.
- Database Technical Functions
  - o Be available to the team as a technical database asset in regards to design and testing of the database.
- Database design
  - o Be involved the proper design of entities (normalization, establish relationships, etc.)
- Testing
  - o Lead the testing of new DB objects which will be deployed as part of an application build.
- Performance tuning

  - o Make sure the performance of the database retrievals are as optimized as possible though proper table design, optimized queries and understanding query execution plans.

How do I Become a DBA? What's needed?

You might wonder what how one becomes a DBA or what their day is like as a DBA. For these purposes I asked two professional DBA's in regards to their experiences, and here were their responses:

1) What would you say are the most essential skills to fulfill a DBA role?

The most essential skills to fulfill a DBA role would be the following (not in any particular order):

- *Storage and capacity management techniques are essential as DBAs must understand the storage (both hardware and software) requirements of their employer. As any company expands so will their data consumption and usage. The DBA must be prepared to support more data, users, and data connections and the ability to analyze and predict growth based on application and data usage patterns and to implement the necessary database changes to accommodate the growth is an important capability of the DBA.*
- *DBAs must be knowledgeable in data modeling, normalization, and overall database design which involve taking a logical data model and creating a purposeful physical design. They should also have the skills needed to design, debug, and implement database objects such as stored procedures, functions, triggers, and views. DBAs must also have data security knowledge and have rules in place to determine which users and groups have access to specific functionality.*
- *An effective database should have metadata/data dictionaries and so a DBA must own this responsibility to retrieve/manage this data to enable the ability to query the organization's metadata.*
- *A true DBA will have backup and recovery procedures in place.*
- *The DBA must ensure data integrity across the database so that accurate data is queried and maintained, such as using referential integrity, triggers, and constraints.*
- *DBAs must conduct SQL code reviews to find performance related issues and recommend any changes to improve the speed database objects.*
- *DBAs must know how to monitor the database environments to address performance related issues which are a huge post implementation nightmare faced by DBAs. A good DBA will know how to troubleshoot performance issues and fine tune a database so that it runs smoothly. This is extremely important to many companies as most as required to be up and running 24x7.*
- *It also does not hurt to have other technical experience in web based technologies, such as XML, C#, Java, firewalls, SSL etc. to full understand how database intertwine with web applications.*

2) What type of training/learning did you take on to become a DBA?

I completed my Bachelors in Computer Information Systems. I went on to earn my Masters in Computer Information Systems with a minor in Information Security which enabled me to get a certification with the NSA. My experience lies with Oracle and SQL Server. I try to go to conferences such as SQL Pass and even local ones such as SQL Saturdays.

3) What advice would you give someone who was looking to become a DBA?

While work experience is always a good thing, my advice would be to stay in school and receive your degrees. Your ability to market yourself will be greater. Also, network with others (LinkedIn) and get involved with technical groups and/or local chapters.

4) What is the most exciting part of your job as a DBA?

There are many exciting parts but some of them would be:

- *Automating processes to save valuable time*
- *Debugging! Encountering that one data issue which requires me to do some serious digging/searching/querying to maybe find out why an event occurred.*
- *Creating reports to make someone else's job easier*
- *Performance tuning - nothing more satisfying than making a process run more efficiently*

Use Case: DBA # 2

1) What would you say are the most essential skills to fulfill a DBA role?

- *Sound understanding and knowledge of Databases & Database management systems (RDBMS Principals/Architecture and NoSQL for future products).*

- *Sound Knowledge of how Operating system, Network, SAN etc work in collaboration with the Database Product to provide services.*

- *Good understanding of how to write code/program which is essential for writing Scripts and Procedures also it helps in understanding the way data is been accessed by Code/program.*

- *Desire to learn and implement new technologies.*

- *Ability to setup & follow the standard procedures and rules and not make any exceptions.*

- *Ability to think rationally & work under pressure and resolve issues in calm manner.*

- *Good people skills which is needed in crises situation when all non-dbas are panicking and behaving probably in non-professional manner.*

- *The last but certainly not the least is the persons liking for the data & Database systems as the DBA's job is not very visible as compared to the coders/developers as sometimes they are the least recognized or appreciated team members.*

2) What type of training/learning did you take on to become a DBA?

- *Studied computer science at the college level that gave me good understanding of different factions of the software & hardware technology.*

- *Took special database Management & data science courses/ Trainings*

- *Did some coding/programming involving the application layer interacting with database components.*
- *Took database certification/courses offered by various vendors.*

3) What advice would you give someone who was looking to become a DBA?

   If someone really wants to become good DBA then
- *They need to analyze their skills and interest and make sure that they have the needed skills as well as liking for the DBA role.*
- *They need to spend good amount of time in making their fundamentals clear about Databases & Database management systems (RDBMS Principals/Architecture and NoSQL for future products).*
- *They need to be ready to handle stress of at times working long hours as well as working at odd hours.*
- *They need to get good training or certification in Database technology that they are willing to take up the job for.*

4) What is the most exciting part of your job as a DBA?

   The most exciting part of the DBA's job is that when you come to work and get to know that all the database servers that he or she is responsible for are up and running smoothly, no nightly Job failed, all database backup completed successfully.

   Data and Databases are the backbone of any successful business as no company can survive without a good quality and reliable data for making business decisions and making future prediction.

   And the most fulfilling factor for DBAs is to know that they contributed in empowering the top management to make right decision by using good quality data and take the company to the next level.

Compensation for a DBA

Per usnews.com, the Labor Department reports that database administrators made a median salary of $77,080 in 2012. The highest-paid 10 percent in the profession earned $118,720, while the lowest-paid earned $42,930 that year. Some of the most highly compensated positions can be found in these industries: computer and peripheral equipment manufacturing, communications equipment manufacturing and natural gas distribution. The top-paying metropolitan areas for this position are scattered throughout the country, with San Francisco, Trenton, N.J., and Washington, D.C., taking the top three spots.

The Mean Salaries for a DBA across the nation have been as followings:

Year	Salary
2004	$68,510
2006	$71,310
2008	$77,140
2010	$75,730
2012	$79,120

DBA Certification

Become certified as a DBA for a particular vendor package keeps your skill set sharp, and tells your employee that you have a solid understanding of the discipline (after all they are entrusting you with their data so it's comforting for them!).

Microsoft: MCDBA
https://www.microsoft.com/learning/en-us/mcdba-certification.aspx

MySQL DBA
https://education.oracle.com/pls/web_prod-plq-dad/ou_product_category.getPage?p_cat_id=159#tabs-3

Oracle Database
http://education.oracle.com/pls/web_prod-plq-dad/db_pages.getpage?page_id=653&get_params=p_id:50

Different level's : Associate, Professional, Master's