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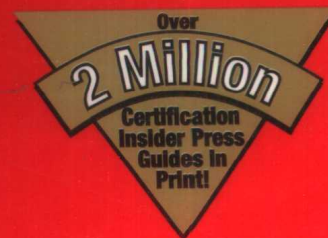
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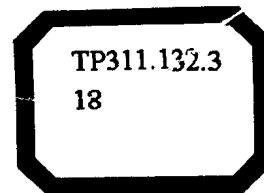# SQL Server 7

Exam 70-028

Microsoft
Certified
Systems
Engineer

MCDBA
Core
Requirement!

Jeffrey R. Garbus, David F. Pascuzzi,
Alvin T. Chang

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MCSE
Administering
SQL Server 7

Jeffrey Garbus
David Pascuzzi
Alvin Chang

I just wanted to say that your books are great! They target the needed information to pass the exam. I passed my test on the first try! Great job.

 —Matthew Bratton, *MCP*

I purchased your *Exam Cram* book for the Enterprise exam and read it cover to cover. My passing score was 842. I am going to buy your books from now on. Thank you very much!

 —David Huff, *Science Applications International Corporation*

I must personally thank you for the *Exam Cram* series. Being well on my way to MCSE+I certification, I have studied ALL the available exam guides. *Exam Cram* stands head and shoulders above all the rest in terms of quality.

 —Paul Cook, *MCP*

I think your books are great! I find your books gave me a fuller understanding of the key concepts and principles you need to grasp to pass the test.

 —M.T. O'Neill, *MCP*

Using your highly acclaimed *Exam Cram* series, I passed the NT Workstation 4 exam on the first try. I plan on sitting for the NT Server 4 exam next, and I already have the *Exam Cram* book for that one by my side!

 —Cameron Ing

The *Exam Cram* series of books is well researched and an excellent complement to other course books. The books represent unparalleled value for money, and I only hope that you keep up the series as new products are released.

 —Sean Kennedy, *MCSE*

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we look forward to hearing about your testing successes!

Administering SQL Server 7

The Cram Sheet

This Cram Sheet contains the distilled, key information for the Administering SQL Server 7.0 exam. Review this information last thing before entering the test room, paying special attention to those areas where you feel you need the most review. If you transfer any of the tasks from this sheet onto a blank piece of paper before beginning the exam, you can refer to it while taking the test.

SERVER INSTALLATION

1. Installation Requirements:

- **CPU** Intel Pentium 166 (or higher) or DEC Alpha AXP.

- **Memory** 32MB (64MB for Enterprise Edition).

- **CD-ROM** Required. (However, it also can be installed from the hard drive or network share).

- **Free hard-disk space for software** 180MB for full installation, 170MB for typical installation, and 90MB for management tools.

- **Operating System** MS Windows NT 4 SP4, Windows 95/98, or Windows NT Enterprise SP4 for Enterprise SQL Server.

- **Internet Explorer** Version 4.01 SP1 or later required.

SECURITY

2. SQL Server supports two types of login authentication: SQL Server authentication and NT authentication.

- SQL Server authentication stores logins and their associated passwords in the SQL Server.

- NT authentication uses the NT Security to validate the user.

3. SQL Server supports two types of roles for granting permissions to groups of users: server roles and database roles.

- Server roles are fixed roles that grant server-wide rights.

- Database roles are used to give database-wide rights.

4. Database roles are classified into two types: fixed and user-defined.

- Fixed database roles are predefined and created for each database.

- User-defined database roles are created by users of a database.

5. Application roles do not have users; instead, access to the role is controlled by your application.

6. Understand the use of the following server roles:

- **sysadmin** Can perform any activity in SQL Server.

- **securityadmin** Manages server logins.

- **serveradmin** Configures server wide settings.

- **setupadmin** Adds and removes linked servers.

- **processadmin** Manages processes.

- **diskadmin** Manages disk files.

- **dbcreator** Creates and alters databases.

7. If you grant an NT User or Group to a database role,the NT User or Group becomes a user of that database.

8. Understand the use of the following fixed database roles:

- **db_owner** Performs activity of all other database roles and other maintenance activities

- **db_accessadmin** Adds and removes database users.

- **db_securityadmin** Manages database roles and statement and object permissions.

- **db_ddladmin** Adds, modifies, and drops objects.

- **db_backupoperator** Backs up the database.

- **db_datareader** Can see all data from every table in the database.

- **db_datawriter** Can add, change, and delete data from every table in the database.

- **db_denydatareader** Bars access to read data.

- **db_denydatawriter** Bars access to write data.

DATABASES

9. If you separate the data, indexes, and transaction log to separate disks, it can improve your performance.

10. Unless you limit a file, a file can grow until it uses all the space on a drive.

TRANSFERRING DATA

11. The **INSERT** statement is used to load one row at a time.

12. **BULK INSERT** is a SQL statement that loads from a file into an existing table.

13. bcp performs similar to **BULK INSERT,** but can also export a table.

14. Neither bcp or **BULK INSERT** can load data into a temporary table.

15. The **SELECT INTO** statement creates a table.

BACKUP

16. A full back up creates a complete copy of a database.

17. A transaction log backup copies and truncates the database log, removing all transactions before the oldest open transaction. Transaction log backups support restoration of a database to the point of failure.

18. A differential backup copies the changes that have been made to a database since its last full backup.

Differential backups can be used in place of transaction log backups but doesn't support recovery of a database to the point of failure.

19. A filegroup backup copies groups of files used to make up a database.

20. Backup strategy is based on the length of time you have to perform a backup and how long you want a database recovery to take.

MONITORING

21. The NT Performance Monitor can be used to chart up to the second performance of servers on the network.

22. The Performance Monitor can track performance counters defined by SQL Server.

23. The Performance Monitor also has alert capabilities.

24. The Profiler collects information on traces (specified events) on the SQL Server.

25. Events can include:
- Connections and disconnections
- Transact-SQL batches
- Statements within stored procedures
- Deadlocks
- Errors

26. Trace information can be stored in a file or in a database.

27. Trace information can include:
- The event being traced
- The name of the user performing a traced task

- The stored procedure or SQL Statement being executed
- The duration of the event
- The severity of any Error messages

28. The output from sp_who indicates whether a user's process is being blocked by another. The blocking process' spid is displayed in the BLK column.

29. The output from sp_lock output will indicate the type of locks being held by a process and on what objects the locks are being held.

30. SET SHOWPLAN_ALL and SET SHOWPLAN_TEXT will display information about how SQL Statements will be executed rather than executing them.

31. SET SHOWPLAN_ALL ON returns data in the form of a table.

32. SET SHOWPLAN_TEXT ON returns data in the form of printed messages.

REPLICATION

33. SQL Server 7 uses a Publisher/Subscriber metaphor as a model for replication.

34. The Publisher/Subscriber components are as follows:
- **Publisher** Makes data available to other servers or database.
- **Distributor** The server that contains the distribution database.

- **Subscriber** Servers that store copies of replicated data and receive updates.
- **Article** Data that will be replicated.
- **Publication** A collection of articles.
- **Push Subscription** Replication initiated by the Publisher.
- **Pull Subscription** Replication initiated by the Subscriber.

35. SQL Server supports three types of replication:

- **Snapshot** Takes data from Publishers and copies it to Subscribers, replacing existing data.
- **Transactional** Takes changes from the Publisher and repeats the changes at the Subscriber.
- **Merge** Allows changes to be made at the Publisher or the Subscriber.

REMOTE DATA SOURCES

36. RPC only lets you call stored procedures; linked server lets you directly access the tables.

37. You must also configure security to allow for the connections.

TROUBLESHOOTING

38. SQL Server will write errors to the SQL Server error log or the NT Application log or both if the Server was started as an NT Service.

39. SQL Server will write errors to the SQL Server error log only if the Server was started at the NT command prompt.

40. When clients fail to connect to a server, check network connectivity to the server with ping or makepipe.

41. Never forget the simple solutions to problems. (For example, sometimes, people fail to access servers because they type the wrong password.)

42. If deadlocking becomes a problem, look in the SQL code and monitor the server for the following:

- Excessively long transactions
- The use of holdlock
- Different SQL scripts or stored procedures that are accessing the same data in different orders

For Penny.
—Jeff Garbus

I dedicate this book to the memory of my mother, Shirley Pascuzzi.
—David Pascuzzi

For my parents.
—Alvin Chang

❧

About The Authors

With a B.S. from Rensselaer Polytechnic Institute, **Jeff Garbus** has experience with PCs to mainframes, and back again. Jeff has many years of client/server and Sybase experience, with a special emphasis on assisting clients in migrating from existing systems to pilot and large-scale projects. Jeff has spoken at user conferences and user groups for many years, written articles and columns for national and international magazines, and has written over 10 books, among them *Sybase System 11 DBA Survival Guide, Sybase System 11 Unleashed, Optimizing SQL Server 7.0,* and the soon-to-be-published *MCSE Database Design On SQL Server 7 Exam Cram,* also published by the Coriolis Group.

Jeff is currently president of Tampa-based Soaring Eagle Consulting, an RDBMS consulting and training firm specializing in solving business problems. He can be reached at **jeffg@soaringeagleltd.com**.

David Pascuzzi is a technical trainer, author, and consultant in computer-related technologies specializing in database technologies for more than 10 years. He has written training courses for the government and private industries, and has written various articles on database technologies.

In his consulting work, David has performed tasks ranging from production database support to database performance tuning to database design. He currently is an MCP for SQL Server. Since attaining his MCP, he has concentrated on developing SQL Server courseware and SQL Server consulting. He can be reached at **pascuzzi@concentric.net**.

Alvin Chang is a technical trainer, author, and consultant working for Soaring Eagle Consulting, a Tampa-based consulting and training firm. An MCP for SQL Server, he has taught SQL Server and consulted throughout the United States. Currently specializing in Microsoft and Sybase System Administration, Alvin started as a technical trainer for products like Microsoft Office, Lotus Smartsuite, and Lotus Notes before moving into RDBMSs. He can be reached at **alvin@soaringeagleltd.com**.

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Most of all, I'd like to thank my family, for giving me the time and space to get the work done.

Thank you all.

—*Jeff Garbus*

I would like to thank Jeff Garbus for including me in this book. Thanks to my parents, Frank and Shirley Pascuzzi, who instilled into me my thirst for knowledge and for teaching me how to analyze problems and get results. Specials thanks to my wonderful wife Paula for letting me do this book, in addition to my full-time job. And, thanks to my daughter Bailey and son Conner for letting daddy work on this book when they wanted to play.

—*David Pascuzzi*

I would like to thank Jeff Garbus for providing me the opportunity to contribute to this book. Thanks to Gary Tyrrell, who listened to me when I needed a break. Thanks to my brother Basil, whose late night phone calls ran up my phone bill, but kept me sane. And a special thanks to my parents Yuling and Yuching Chang, who got me started on computers in the first place.

—*Alvin Chang*

Introduction

Welcome to the *MCSE Administrating SQL Server 7 Exam Cram*! This book aims to help you get ready to take—and pass—the Microsoft certification test numbered "Exam 70-028," titled "Administering Microsoft SQL Server 7.0." This Introduction explains Microsoft's certification programs in general and talks about how the Exam Cram series can help you prepare for Microsoft's certification exams.

Exam Cram books help you understand and appreciate the subjects and materials you need to pass Microsoft certification exams. Exam Cram books are aimed strictly at test preparation and review. They do not teach you everything you need to know about a topic (such as the ins and outs of designing or programming the SQL Server). Instead, we (the authors) present and dissect the questions and problems we've found that you're likely to encounter on a test. We've worked from Microsoft's own training materials, preparation guides, and tests, and from a battery of third-party test preparation tools. Our aim is to bring together as much information as possible about Microsoft certification exams.

Nevertheless, to completely prepare yourself for any Microsoft test, we recommend that you begin by taking the Self-Assessment included in this book immediately following this Introduction. This tool will help you evaluate your knowledge base against the requirements for an MCSE under both ideal and real circumstances.

Based on what you learn from that exercise, you might decide to begin your studies with some classroom training, or that you pick up and read one of the many study guides available from Microsoft or third-party vendors, including The Coriolis Group's Exam Prep series.

We also strongly recommend that you install, configure, and play with the software or environment that you'll be tested on, because nothing beats hands-on experience and familiarity when it comes to understanding the questions you're likely to encounter on a certification test. Book learning is essential, but hands-on experience is the best teacher of all!

The Microsoft Certified Professional (MCP) Program

The MCP Program currently includes seven separate tracks, each of which boasts its own special acronym (as a would-be certificant, you need to have a high tolerance for alphabet soup of all kinds):

➤ **MCP (Microsoft Certified Professional)** This is the least prestigious of all the certification tracks from Microsoft. Attaining MCP status requires an individual to pass one exam. Passing any of the major Microsoft exams (except the Networking Essentials Exam) qualifies an individual for MCP credentials. Individuals can demonstrate proficiency with additional Microsoft products by passing additional certification exams.

➤ **MCP + I (Microsoft Certified Professional plus Internet)** This mid-level certification is attained by completing three core exams: Windows NT Server, TCP/IP, and Internet Information Server.

➤ **MCP + SB (Microsoft Certified Professional + Site Building)** This new certification program is designed for individuals who are planning, building, managing, and maintaining Web sites. Individuals with the MCP + SB credential will have demonstrated the ability to develop Web sites that include multimedia and searchable content and Web sites that connect to and communicate with a back-end database. It requires one MCP exam, plus two of these three exams: Designing and Implementing Commerce Solutions with Microsoft Site Server 3.0 Commerce Edition, Designing and Implementing Web Sites with Microsoft FrontPage 98, and Designing and Implementing Web Solutions with Microsoft Visual InterDev 6.0.

➤ **MCSE (Microsoft Certified Systems Engineer)** Anyone who has a current MCSE is warranted to possess a high level of expertise with Windows NT (either version 3.51 or 4) and other Microsoft operating systems and products. This credential is designed to prepare individuals to plan, implement, maintain, and support information systems and networks built around Microsoft Windows NT and its BackOffice family of products.

To obtain an MCSE, an individual must pass four core operating system exams, plus two elective exams. The operating system exams require individuals to demonstrate competence with desktop and server operating systems and with networking components.

You must pass at least two Windows NT–related exams to obtain an MCSE: one on Implementing and Supporting Windows NT Server (version 3.51 or 4) and the other on Implementing and Supporting Windows NT Server in the Enterprise (version 3.51 or 4). These tests are intended to indicate an individual's knowledge of Windows NT in smaller, simpler networks and in larger, more complex, and heterogeneous networks, respectively.

You must pass two additional tests as well. These tests are networking and desktop operating system related. At present, the networking requirement can only be satisfied by passing the Networking Essentials test. The desktop operating system test can be satisfied by passing a Windows 95, Windows NT Workstation (the version must match whichever core curriculum is pursued), or Windows 98 test.

The two remaining exams are elective exams. An elective exam may fall in any number of subject or product areas, primarily BackOffice components. These include tests on IE4, SQL Server, IIS, SNA Server, Exchange Server, Systems Management Server, and the like. However, it is also possible to test out on electives by taking advanced networking topics like Internetworking with Microsoft TCP/IP (but here again, the version of Windows NT involved must match the version for the core requirements taken). If you are on your way to becoming an MCSE and have already taken some exams, visit **www.microsoft.com/mcp/certstep/mcse.htm** for information about how to proceed with your MCSE certification.

Whatever mix of tests is completed toward MCSE certification, individuals must pass six tests to meet the MCSE requirements. It's not uncommon for the entire process to take a year or so, and many individuals find that they must take a test more than once to pass. Our primary goal with the Exam Cram series is to make it possible, given proper study and preparation, to pass all of the MCSE tests on the first try. Table 1 shows the required and elective exams for the MCSE certification.

➤ **MCSE + I (Microsoft Certified Systems Engineer + Internet)** This is a newer Microsoft certification and focuses not just on Microsoft operating systems, but also on Microsoft's Internet servers and TCP/IP.

To obtain this certification, an individual must pass seven core exams, plus two elective exams. The core exams include not only the server operating systems (NT Server and Server in the Enterprise) and a desktop OS (Windows 95, Windows 98, or Windows NT Workstation), but also include Networking Essentials, TCP/IP, Internet Information Server (IIS), and the Internet Explorer Administration Kit (IEAK).

Table 1   MCSE Requirements*

Core

All 3 of these are required	
Exam 70-067	Implementing and Supporting Microsoft Windows NT Server 4.0
Exam 70-068	Implementing and Supporting Microsoft Windows NT Server 4.0 in the Enterprise
Exam 70-058	Networking Essentials
Choose 1 from this group	
Exam 70-064	Implementing and Supporting Microsoft Windows 95
Exam 70-073	Implementing and Supporting Microsoft Windows NT Workstation 4.0
Exam 70-098	Implementing and Supporting Microsoft Windows 98

Elective

Choose 2 from this group	
Exam 70-088	Implementing and Supporting Microsoft Proxy Server 2.0
Exam 70-079	Implementing and Supporting Microsoft Internet Explorer 4.0 by Using the Internet Explorer Administration Kit
Exam 70-087	Implementing and Supporting Microsoft Internet Information Server 4.0
Exam 70-081	Implementing and Supporting Microsoft Exchange Server 5.5
Exam 70-059	Internetworking with Microsoft TCP/IP on Microsoft Windows NT 4.0
Exam 70-028	Administering Microsoft SQL Server 7.0
Exam 70-029	Designing and Implementing Databases on Microsoft SQL Server 7.0
Exam 70-056	Implementing and Supporting Web Sites Using Microsoft Site Server 3.0
Exam 70-086	Implementing and Supporting Microsoft Systems Management Server 2.0
Exam 70-085	Implementing and Supporting Microsoft SNA Server 4.0

*   This is not a complete listing—you can still be tested on some earlier versions of these products. However, we have included mainly the most recent versions so that you may test on these versions and thus be certified longer. We have not included any tests that are scheduled to be retired.

The two remaining exams are elective exams. These elective exams can be in any of four product areas: SQL Server, SNA Server, Exchange Server, or Proxy Server. Table 2 shows the required and elective exams for the MCSE+I certification.

➤ **MCSD (Microsoft Certified Solution Developer)** The new MCSD credential reflects the new skills required to create multitier, distributed, and COM-based solutions, in addition to desktop and Internet applications, using new technologies. To obtain an MCSD, an individual must demonstrate the ability to analyze and interpret user requirements; select and integrate products, platforms, tools, and technologies; design and implement code and customize applications; and perform necessary software tests and quality assurance operations.

Table 2   MCSE+Internet Requirements*

Core

All 6 of these are required	
Exam 70-067	Implementing and Supporting Microsoft Windows NT Server 4.0
Exam 70-068	Implementing and Supporting Microsoft Windows NT Server 4.0 in the Enterprise
Exam 70-058	Networking Essentials
Exam 70-059	Internetworking with Microsoft TCP/IP on Microsoft Windows NT 4.0
Exam 70-087	Implementing and Supporting Microsoft Internet Information Server 4.0
Exam 70-079	Implementing and Supporting Microsoft Internet Explorer 4.0 by Using the Internet Explorer Administration Kit
Choose 1 from this group	
Exam 70-064	Implementing and Supporting Microsoft Windows 95
Exam 70-073	Implementing and Supporting Microsoft Windows NT Workstation 4.0
Exam 70-098	Implementing and Supporting Microsoft Windows 98

Elective

Choose 2 from this group	
Exam 70-088	Implementing and Supporting Microsoft Proxy Server 2.0
Exam 70-081	Implementing and Supporting Microsoft Exchange Server 5.5
Exam 70-028	Administering Microsoft SQL Server 7.0
Exam 70-029	Designing and Implementing Databases on Microsoft SQL Server 7.0
Exam 70-056	Implementing and Supporting Web Sites Using Microsoft Site Server 3.0
Exam 70-085	Implementing and Supporting Microsoft SNA Server 4.0

* This is not a complete listing—you can still be tested on some earlier versions of these products. However, we have included mainly the most recent versions so that you may test on these versions and thus be certified longer. We have not included any tests that are scheduled to be retired.

To become an MCSD, you must pass a total of four exams: three core exams (available fall 1998) and one elective exam. The required exam is Analyzing Requirements and Defining Solution Architectures (Exam 70-100). Each candidate must also choose one of these two desktop application exams—Designing and Implementing Desktop Applications with Microsoft Visual C++ 6.0 (Exam 70-016) or Visual Basic 6.0 (Exam 70-176)—PLUS one of these two distributed application exams—Designing and Implementing Distributed Applications with Visual C++ 6.0 (Exam 70-015) or Visual Basic 6.0 (Exam 70-175).

Elective exams cover specific Microsoft applications and languages, including Visual Basic, C++, the Microsoft Foundation Classes, Access, SQL Server, Excel, and more. If you are on your way to becoming an MCSD and have already taken some exams, visit **Microsoft.com/train_cert** for information about how to proceed with your MCSD certification under this new track.

➤ **MCDBA (Microsoft Certified Database Administrator)** The MCDBA credential reflects the skills required to implement and administer Microsoft SQL Server databases. To obtain an MCDBA, an individual must demonstrate the ability to derive physical database designs, develop logical data models, create physical databases, create data services by using Transact-SQL, manage and maintain databases, configure and manage security, monitor and optimize databases, and install and configure Microsoft SQL Server.

To become an MCDBA, you must pass a total of five exams: four core exams and one elective exam. The required core exams are "Administering Microsoft SQL Server 7.0," "Designing and Implementing Databases with Microsoft SQL Server 7.0," "Implementing and Supporting Microsoft Windows NT Server 4.0," and "Implementing and Supporting Microsoft Windows NT Server 4.0 in the Enterprise."

The elective exams that you can choose from cover specific uses of SQL Server and include "Designing and Implementing Distributed Applications with Visual Basic 6.0," "Designing and Implementing Distributed Applications with Visual C++ 6.0," "Designing and Implementing Data Warehouses with Microsoft SQL Server 7.0 and Microsoft Decision Support Services 1.0," and two exams that relate to NT: "Internetworking with Microsoft TCP/IP on Microsoft Windows NT 4.0" and "Implementing and Supporting Microsoft Internet Information Server 4.0".

Note that the exam covered by this book can be used as the elective for the MCDBA certification. Table 3 shows the requirements for the MCDBA certification.

➤ **MCT (Microsoft Certified Trainer)** Microsoft Certified Trainers are individuals who are deemed capable of delivering elements of the official Microsoft training curriculum, based on technical knowledge and instructional ability. Thus, it is necessary for an individual seeking MCT credentials (which are granted on a course-by-course basis) to pass the related certification exam for a course and successfully complete the official Microsoft training in the subject area, as well as demonstrate an ability to teach.

This latter criterion may be satisfied by proving that one has already attained training certification from Novell, Banyan, Lotus, the Santa Cruz Operation, or Cisco, or by taking a Microsoft-sanctioned workshop on instruction. Microsoft makes it clear that MCTs are important cogs in the Microsoft training channels. Instructors must be MCTs before Microsoft will allow them to teach in any of its official training