**4. Find and document as much as possible for the Microsoft Management Console (MMC)**

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Microsoft Management Console (MMC) is a component of [Windows 2000](http://en.wikipedia.org/wiki/Windows_2000) and its successors that provides system administrators and advanced users an interface for configuring and monitoring the system.

# Snap-ins and consoles

By itself, MMC doesn’t actually manage anything. Instead, it’s a framework that accepts management snap-ins. It’s the snap-ins that do the actual managing. The main point of MMC is that it provides a consistent framework for building management snap-ins. That way, the snap-ins all behave in similar ways. As a result, you don’t have to struggle to learn completely different tools to manage various aspects of Windows Server 2008.

Most of Microsoft's administration tools are implemented as MMC snap-ins. Third parties can also implement their own snap-ins using the MMC's [application programming interfaces](http://en.wikipedia.org/wiki/Application_programming_interface) published on the [Microsoft Developer Network](http://en.wikipedia.org/wiki/Microsoft_Developer_Network)'s web site.

Advantage of MMC is that you can create your own custom management consoles with just the right combination of snap-ins. For example, suppose that you spend most of your time managing user accounts, disk devices, and IIS (Internet Information Services, the web server that comes with Windows Server 2008), and studying event logs. You can easily craft a management console with just these four snap-ins.

# Common snap-ins

The most prolific MMC component, Computer Management, appears in the Administrative Tools folder in the [Control Panel](http://en.wikipedia.org/wiki/Control_Panel_(Windows)). Computer Management is actually a collection of MMC snap-ins, including the [Device Manager](http://en.wikipedia.org/wiki/Device_Manager), [Disk Defragmenter](http://en.wikipedia.org/wiki/Windows_Disk_Defragmenter), [Internet Information Services](http://en.wikipedia.org/wiki/Internet_Information_Services)(if installed), [Disk Management](http://en.wikipedia.org/wiki/Logical_Disk_Manager), [Event Viewer](http://en.wikipedia.org/wiki/Event_Viewer), Local Users and Groups (except in the home editions of Windows), [Shared Folders](http://en.wikipedia.org/wiki/Network_share), and other tools. Computer Management can also be pointed at another Windows machine altogether, allowing for monitoring and configuration of other computers on the Windows 7 contains the following built-in MMC snap-ins:

* [**ActiveX Control**](http://searchsecurity.techtarget.com/answer/Removing-ActiveX-controls) – This snap-in allows you to add individual ActiveX controls to view and configure. ActiveX controls are Internet Explorer plug-ins that are used to add functionality to the browser.
* **Authorization Manager** – This snap-in allows you to set permissions for Authorization Manager-enabled applications.
* **Certificates** – This snap-in allows you to configure the different certificate stores available on the system. Certificates help provide a secure operating environment for your system. You can use them for identification, securing data, and securing communications. There are certificate stores in place for users, applications, and the system itself.
* **Component Services** – This snap-in is used to manage the system's [COM+](http://searchwinit.techtarget.com/definition/COM), or Component Services configuration. You can also configure Distributed Computer Object Model ([DCOM](http://whatis.techtarget.com/definition/DCOM-Distributed-Component-Object-Model)) and Distributed Transaction Coordinator (DTC) settings using this snap-in. These are especially important when programs need to communicate between multiple computers.
* **Computer Management**– This snap-in is actually a collection of snap-ins used for task scheduling, disk management, performance monitoring, and many other configuration and management tasks. These snap-ins are grouped together under **Computer Management** for ease of use.
* [**Device Manager**](http://searchsystemschannel.techtarget.com/tip/Manage-Windows-7-hardware-with-Device-Manager) – This snap-in is used for viewing and configuration of hardware devices installed on the system. You disable devices, update drivers, and troubleshoot potential issues with your hardware devices.
* [**Disk Management**](http://searchsystemschannel.techtarget.com/feature/Using-the-Disk-Management-MMC-to-manage-Windows-7-disks) – This snap-in is used for disk and volume management. You can create volumes, format disks, and enable fault tolerance.
* **Event Viewer** – This snap-in is used to view the system event logs. These logs can help you determine if your system or applications are having problems. The Security log can also be used to determine if there is unauthorized access to your system.
* **Folder** – This snap-in is used to add a folder than can be used for organizing your snap-ins. This can come in very handy if you have added many snap-ins to a single MMC console.
* **Group Policy Object Editor** – This snap-in is used for configuring the [Group Policy Objects](http://searchwindowsserver.techtarget.com/definition/Group-Policy-Object) on the system. Group policies are used to provide a centralized way for managing your systems.
* **IP Security Monitor** – This snap-in is used to monitor the status of your [IP Security](http://searchmidmarketsecurity.techtarget.com/definition/Ipsec)(IPsec) configuration. IPsec is used to secure communications between computers. This snap-in can help you determine which IPsec policies are being applied to your systems.
* **IP Security Policy Management** – This snap-in is used to understand and configure the settings in your IPsec policy.
* **Link to Web Address** – This snap-in allows you to add a Web page to the MMC. This can be useful for applications and systems with Webbased management.
* **Local Users and Groups** – This snap-in allows you to configure [users and groups on the local system](http://searchsystemschannel.techtarget.com/tip/Windows-7-user-accounts-and-groups-management). You can add user accounts, delete user accounts, and configure various user properties.
* **NAP Client Configuration** – This snap-in allows you to configure [Network Access Protection](http://searchconsumerization.techtarget.com/definition/network-access-protection-NAP) (NAP) client configuration settings. NAP is a security feature that is used to limit who can gain access to your network.
* [**Performance Monitor**](http://searchsystemschannel.techtarget.com/feature/Using-Windows-7-performance-monitor-to-view-data)– This snap-in allows you to monitor your system performance, including memory, hard disks, processors, and many other components.
* **Print Management** – This snap-in is used to manage print servers and printers connected to the system.
* [**Resultant Set of Policy**](http://searchwindowsserver.techtarget.com/definition/RSoP-Resultant-Set-of-Policy) – This snap-in is used to show what settings will be applied to the system after all policies have been applied. This helps when you want to test out your Group Policy settings without actually applying them to the system.
* [**Security Configuration and Analysis**](http://searchwindowsserver.techtarget.com/feature/Deploying-security-templates#scatool) – This snap-in provides configuration and analysis of security templates being applied to the system.
* **Security Templates** – This snap-in allows you to edit the security templates that can be applied to the system.
* **Services**– This snap-in allows to you view and configure the properties for services running on the system. You can disable, start, stop, or restart services. You can also configure authentication and fault tolerance for services.
* **Shared Folders** – This snap-in allow you to view properties and status information for file shares that exist on the system. You can see what folders are beings shared and who is accessing them.
* **Task Scheduler** – This snap-in allows you to sche
* dule tasks to be automatically run at specified times and/or at specified intervals.
* **TPM Management** – This snap-in allows you to configure the Trusted Platform Module, if one exists in the system. [Trusted Platform Modules](http://whatis.techtarget.com/definition/trusted-platform-module-TPM) are used to generate keys for cryptographic operations.
* [**Windows Firewall with Advanced Security**](http://searchmidmarketsecurity.techtarget.com/tip/Windows-Firewall-with-Advanced-Security-beefs-up-Windows-7-security) – This snap-in allows you to configure Windows Firewall settings on the system. You can control what processes, applications, and systems can access your system or generate network traffic from your system.
* **WMI Control** – This snap-in allows you to configure and manage the Windows Management Instrumentation (WMI) service. WMI is used for management and monitoring of Windows systems.

# Using

There are several ways to open a Microsoft Management Console window. The easiest is to open one of the predefined consoles that come with Windows Server 2008. These consoles are available from the Start→Administrative Tools menu.

You can also start MMC from a command prompt or from the Run dialog box (opened by choosing Start→Run). To start MMC without opening a snap-in, just type mmc at a command prompt or in the Run dialog box. To open a specific console, type the path to the console file after mmc. For example, the following command opens the Computer Management console:

mmc \Windows\System32\compmgmt.msc

A typical Microsoft Management Console window follows, displaying the Active Directory Users and Computers snap-in. As you can see, the MMC window consists of two panes. The pane on the left is a tree pane that displays a hierarchical tree of the objects that you can manage. The pane on the right is a details pane that shows detailed information about the object that’s selected in the tree pane.

To add snap-ins to an MMC console, do the following:

* Run the command **MMC.exe** from a command prompt or from the Windows 7 Search bar.
* If prompted by [UAC](http://searchsystemschannel.techtarget.com/tip/Windows-7-user-accounts-and-groups-management) to allow the MMC to make changes to the computer, click **Yes**. This should bring up a blank MMC console.
* From the File menu, select **Add/Remove Snap-in**.
* From the Add or Remove Snap-ins window, choose the snap-in you want to add. Click**Add**. Depending on the snap-in you add, you may be prompted for additional information.
* After you have added all your snap-ins, click OK. You snap-ins should now appear in the MMC.

The MMC can be very flexible. You can add whatever snap-ins you want to a blank MMC console. You can also modify one of the predefined management tools that use the MMC. After you have modified an MMC console, you have the option to save your changes. Simply select **File** | **Save** or **File** | **Save As**, whichever is appropriate.

There are also other options available for controlling what can and cannot be done inside an MMC console. If you choose **File** | **Options**, you will be presented with the MMC Options window, as seen in Figure 5.23. Here, you can change the icon used for console, or set the console mode. The console mode determines what users can and cannot see within the console and what changes they can make. The following are the four basic console modes available for the MMC:

* **Author mode** – This mode gives you full access to do anything in the MMC. You can add and remove snap-ins, create views, and open new windows.
* **User mode – full access** – This mode give you full access to the tree within the MMC. But, you cannot add or remove snap-ins.
* **User mode – limited access, multiple window** – This mode prevents you from being able to view contents of the tree that are not visible in the console window.
* **User mode – limited access, single window** – This mode opens the console with just a single window. Users cannot view items that do not appear in that window.

# Version history

* MMC 1.0, shipped with [Windows NT 4.0](http://en.wikipedia.org/wiki/Windows_NT_4.0) Option Pack.
* MMC 1.1, shipped with [SQL Server](http://en.wikipedia.org/wiki/Microsoft_SQL_Server) 7.0 and [Systems Management Server](http://en.wikipedia.org/wiki/Microsoft_Systems_Management_Server) 2.0, and also made available as a download for [Windows 9x](http://en.wikipedia.org/wiki/Windows_9x) versions and [Windows NT](http://en.wikipedia.org/wiki/Windows_NT).
* MMC 1.2, shipped with [Windows 2000](http://en.wikipedia.org/wiki/Windows_2000).
* MMC 2.0, shipped with [Windows XP](http://en.wikipedia.org/wiki/Windows_XP) and [Windows Server 2003](http://en.wikipedia.org/wiki/Windows_Server_2003).
* MMC 3.0, shipped with Windows Server 2003 R2, Windows Server 2003 SP2, [Windows Vista](http://en.wikipedia.org/wiki/Windows_Vista), [Windows Server 2008](http://en.wikipedia.org/wiki/Windows_Server_2008) and Windows XP SP3. Also downloadable for Windows XP SP2 and Windows Server 2003 SP1. New features:
  + A new "Actions pane", displayed on the right-hand side of the MMC user interface that displays available actions for currently-selected node
  + Support for developing snap-ins with the [.NET framework](http://en.wikipedia.org/wiki/.NET_framework), including [Windows Forms](http://en.wikipedia.org/wiki/Windows_Forms)
  + Reduced amount of code required to create a snap-in
  + Improved debugging capabilities
  + Asynchronous user interface model (MMC 3.0 snap-ins only)
  + True Color Icon Support (Windows Vista Only)
  + New Add/Remove Snap-in UI
  + [DEP](http://en.wikipedia.org/wiki/Data_Execution_Prevention) is always enforced. All snap-ins must be [DEP](http://en.wikipedia.org/wiki/Data_Execution_Prevention)-aware.

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