WINDOWS 98 REGISTRY

The REGISTRY

Microsoft Windows versions beginning with Win95 replaced the old .ini files with the Registry. The old .ini files being text based were limited to 64KB and restricted the number of programs you could install. Even installing programs requiring the .ini to grow beyond 32KB was just asking for trouble. Accessing these .ini files to run a program was very slow as the .ini files grew in size.

In Win 3.x a Registry file was used and it became the basis for the Win95 & Win98 Registry.
The Win95 Registry was the first centralized configuration database. It's objectives were:
1. To have all configuration info, user & system, in one place.
2. To have the multiple configuration info, user & system, in one place.
3. To have the hardware and operating system info stored in one place.
4. To have a database that is recoverable after a crash.
5. To have a database that is not limited to 64KB.
6. To have a database that the system administrators could configure using the Control Panel tools or other utilities.
7. To have a database that would allow independent examination of it either locally or remotely.
8. To have a database that would allow developers to access it's entries using a set of API calls.(Application Programming Interface)

REGISTRY ARCHITECTURE:
Registry info is organized in KEYS where each key contains one or more subkeys and each subkey contains a VALUE unless that subkey's value is not set.

The subkeys allows for grouping settings. A branch therefore includes info about the user, the hardware, the application,etc.

Windows Explorer uses similar structure. The Registry can be compared to a Directory Tree of the Windows Explorer. The Keys are similar to Windows Explorer's Directories, the Registry Values are similar to the Windows Explorer's files.

Windows 98 Registry has 6 Root Keys which reflects different aspects of configuration data, e.g. user data and machine-dependent settings. Each ROOT KEY begins with HKEY and each ROOT KEY has several SUBKEYS.

I.   HKEY_CLASSES_ROOT
II.   HKEY_USERS
III.   HKEY_CURRENT_USER
IV.   HKEY_LOCAL_MACHINE
V.   HKEY_CURRENT_CONFIG
VI.   HKEY_DYN_DATA

Windows XP has 5

HKEY_CLASSES_ROOT
HKEY_CURRENT_USER
HKEY_LOCAL_MACHINE
HKEY_USERS
HKEY_CURRENT_CONFIG

I.   HKEY_CLASSES_ROOT
This KEY contains all data used in Win98 for OLE and drag & drop operations including all registered file types and their properties. Registry file types enable user to open a file by doubleclicking. Properties include the icons and the commands users can use for these file types. Many subkeys (.bat,.bmp,etc) pertain to file extensions which contain icon and command properties. Most of the entries in HKEY_CLASSES_ROOT can also be found in HKEY_LOCAL_MACHINE\software\classes.

II.   HKEY_USERS
This KEY contains specific user information, e.g. customized desktop settings,etc.
It contains default settings for the desktop, START menu, Applications,etc. When a new user logs into the computer system, the default settings are copied into a separate subkey with that user's name. All changes that that user makes are stored into this subkey with the users name. Example: HKEY_USERS\Miller. The HKEY_USERS also contains a subkey named SOFTWARE.

III.   HKEY_CURRENT_USER
This is a copy of the subkey HKEY_USERS\name where name is the name of the active user or HKEY_USERS\default.

It has several subkeys:
-        APPEVENTS – Contains paths to sound files that are loaded for particular system events, e.g. when an error message occurs and a sound occurs.
-        CONTROL PANEL – Contains data that can be altered in the Control Panel e.g. Display Settings.
-        DISPLAY – Contains data for display settins of the CURRENT USER. This key is available only when a user is logged on with the user profiles enabled.
-        INSTALL LOCATION MRU – Contains values defining paths used during the last install. (MRU = most recently used files or commands). These are listed as a,b,c,d,etc.
-        KEYBOARD LAYOUT – Current active keyboard layout that was set using the keyboard option in the Control Panel.
-        NETWORK – Describes persistent and recent network connections and the network state, if available.
-        REMOTE ACCESS – Settings of remote access available only if the remote access service is installed, e.g. AOL.
-        SOFTWARE – Current user specific application settings,formerly stored in the WIN.INI. (Specific application option settings for the whole machine are stored in the HKEY_LOCAL_MACHINE).

IV.   HKEY_LOCAL_MACHINE
Defines all specific information for the local machine. E.g. drivers, installed hardware, port mappings and software configurations. It has several subkeys:

- CONFIG – Machine configurations are stored here. This information is updated during Win98 setup and during Win98 startup. It contains 2 subkeys: Display Settings and System Printers.
- DRIVER – Contains subkeys with names like 4 and 11 (undetermined purpose)
- ENUM – Windows uses a feature called Bus Enumerations for the bookkeeping of all installed hardware components which is used to build the Device Manager.
- HARDWARE – Settings for the serial ports (in the Device Map subkey) available on the local machine. The subkey DESCRIPTION contains entries for devices installed in the system, e.g. labels to describe the central processor, the floating-point processor and the multifunction adapter.
- NETWORK – When Win98 runs in a network, this subkey contains user-login information e.g. Name, network provider, logon validation, policy info,etc.
- SECURITY – Available for networked computers. Information re security provider.
- SOFTWARE – All information about installed software. The subkey of this branch (\Classes) is used to construct HKEY_CLASSES_ROOT. (See # 1).
- SYSTEM – All data required for Win98 to start. Subkey CURRENT CONTROL SET contains subkeys CONTROL & SERVICE. The Control subkey contains information e.g. computer name, settings for file system,etc. The Service subkey lists the services used in Win98.

V.   HKEY_CURRENT_CONFIG
This handles Plug and Play (PNP) and has information about Current Configuration of a multiple hardware configuration computer, e.g. a docking station. The settings here match the one set of configuration settings stored in HKEY_LOCAL_MACHINE\config key.

VI.   HKEY_DYN_DATA
Contains keys that store dynamic status information of multiple devices. This data can be used by monitoring programs to detect hardware problems, device status, or changing configurations.

The Device Manager uses this data to show current hardware configurations. All data in this root key is read and modified by the system. Some data can be altered by the user but other data can only be updated by the system itself.

Registry entries are not case sensitive. The registry can be accessed using API (application program Interface commands) function keys or by using a registry editor (REGEDIT)

For an individual user, a single file is adequate to store the registry. In a network, a single fire for the registry would allow any single user to modify user-specific data and also modify system configurations which could create havoc. So Win98 separates the 2 types registry data and stores the information in two separate files:System.dat and User.dat.

SYSTEM.DAT – Contains system configuration and settings e.g. hardware configuration, plug & play settings and application settings. These settings are used in startup to load specific device

drivers and to determine what hardware is available. System.dat is always located on the LOCAL MACHINE in the Win98 directory (\windows\local machine)

USER.DAT – User-specific information e.g. login name, desktop settings, start menu settings,etc. During Windows setup the User.dat is stored in the (\windows) directory but may be relocated to a \windows\profiles subdirectory.

The INI FILES IN WIN98 - WIN.INI and SYSTEM.INI
The WIN.INI and SYSTEM.INI are still found in the \windows directory of Win98. These are used for WIN 16 based applications. When a WIN 16 based application is installed, its setup program creates .INI settings but doesn't update the Registry because the WIN 16 based application was designed for a Pre-Registry versions of Windows e.g. Windows 3.x. When there is an upgrade from Windows 3.x to WIN98 some of these .INI files are moved to the Registry.

WIN32 based applications do not use .INI files.

**WHEN SHOULD THE REGISTRY BE MODIFIED – NEVER!!! Unless you really KNOW what you're doing.
Values in the Registry must be stored in a consistent manner or you can crash your system PERMANENTLY.**

However, if you must modify your Registry, let installation routines, setup programs, and utilities do the work for you whenever possible.

Most of the Registry changes necessary can be done by using the Control Panel features e.g. System Settings, Display Properties settings,etc. Or you can use the tool REGISTRY EDITOR (REGEDIT) to change or remove a specific value.

REGEDIT should only be used as a last resort. Before using REGEDIT a backup copy of the present Registry should be made and stored in a folder on the hard drive or on a cd if a CD-Writer is available to you. The Registry will not fit on a floppy disk.

1. Create a folder on your C: drive and name it Aregistry Backup.
2. Click START…RUN and type in regedit. Click OK
3. The Registry will open. Click File and EXPORT Registry, locate the folder into which you will store this copy.
4. Name the backup copy Reg and the date the backup is made, e.g. Reg 3 12 02.
5. Click SAVE.

NOTE: You may not import a Reg file to an older computer.

The REGEDIT.EXE is located in the \windows directory. Microsoft doesn't automatically load an icon for REGEDIT on the desktop in order to prevent novice users from using this most valuable but dangerous tool.

A Registry backup may also be created in MS- DOS. At the C:\> prompt type in scanreg /backup and press ENTER.

 Before creating a backup of the Registry or modifying it:
1. Make an Emergency STARTUP disk using the feature in the Control Panel's Add/Remove Programs. The computer will not start correctly with a corrupted Registry.
2. Each time Win98 starts it scans the Registry. If no problems are found, then the Registry Checker makes a backup copy of the Registry. If a problem is found, the Registry Checker attempts to FIX the Registry and then makes a backup copy.
3. Locate ScanregW.exe in \windows. Doubleclick to create a backup of the Registry. It will first scan the Registry and if no problems are found, will ask if you wish to create a backup. (C:\> type in scanreg /backup and press ENTER).
4. To Restore the Registry in MS-DOS at the C:\> type in scanreg /restore and press ENTER. Locate the last known "good" backup.
5. IF no backup is available, type Scanreg /FIX and press ENTER to repair the Registry.
6. To both test if the Registry is corrupted and to make a backup,   at the C:\> type
7. scanregw /autoscan and press ENTER.
8. To only test whether the Registry is corrupted, type at the C:\>scanregw /scanonly. NOTE: The AUTOSCAN and SCANONLY options are available for use only with ScanRegW, not with ScanReg.

REGISTRY EDITOR
Menu Bar:
- Registry - Print, Import or Export registry data
- Edit – Create, Delete, Rename, Find key values
- View – Switch status bar on and off to change pane size and to refresh display
- Help – Help topics

KEY VALUES DISPLAY
Right Pane – 2 columns
1st Column is Name of value
2nd Column is Data column and contains values themselves. Every key value must have at least one name (default), although it may not have it's value set.

ERROR CODES RETURNED BY SCANREG.EXE
Error Level   Remark
        0   No problems found
        1   Fixable errors found
        2   Reg bad, can't be fixed
        -2   Not enough memory. HIMEM requested
        -3   File not found. Reg files missing
        -4   Unable to create USER.DAT or SYSTEM.DAT
        -5   Reading Registry failed

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Suddenly your computer goes bonkers!!! Nothing you check gives you an indication of what the problem is.
When all checks fail, you may consider a registry restore back to a time prior to the problems development.

CAUTION: BEFORE RESTORING THE REGISTRY IT IS IMPORTANT TO BACKUP YOUR PRESENT REGISTRY JUST IN CASE YOU NEED TO RESTORE IT TO IT'S PRESENT REGISTRY.

Backup Registry:
1. **Create a folder on the c:\ drive and name it Aregistry.**
   Go to EXPLORE, click the c:\ drive, click FILE…New…Folder. Type in Aregistry and click ENTER twice. You will see the folder appear on the left side of the screen under the C:\ drive.
2. **Click START…RUN and type in regedit.**
3. **Click FILE…EXPORT REGISTRY.**
4. **Click the down arrow in the box that appears. Doubleclick the C:\ drive then doubleclick Aregistry folder so that Aregistry appears in the top box.**
5. **Now give the registry backup file a name, e.g. REG 01 23 02**
6. **Click SAVE**
7. **If the registry restore does fix the problems you're having, then go back to the AREGISTRY folder and delete this backup registry file so it will not be used to restore in the future and bring back these problems that you're trying to fix.**

Win 98 or Win98SE Registry Restore
1. Click **Start**, and then click **Shut Down**.
2. Click **Restart in MS-DOS mode**, and then click **Yes**.
3. At the MS-DOS prompt, C:\Windows>
4. Type cd\   and press the ENTER key. It should now go to the C:\> prompt.
5. Type `scanreg /restore and press the ENTER key.`
6. `Follow the onscreen prompts and take it back to before the virus or`
   `whatever. Some computers only let you take it back 3 days.`

7. Restart your computer.

Note

- Following this procedure will restore your registry to its state when you last successfully started your computer.

Win XP has a built in Restore feature:

1. Click START…All Programs
2. Click Accessories….System Tools….System Restore

ME RESTORATION

SYMPTOMS

When you attempt to restore a checkpoint that you created after September 8, 2001 in Windows Millennium Edition (Me), the restore procedure does not work after you restart your computer and you may receive the following error message:

Restoration Was Unsuccessful

CAUSE:This problem occurs because the algorithm that is used to calculate the checkpoint file name does not work after September 8, 2001.

RESOLUTION: Microsoft has released an update the corrects this problem. When you install this update, a checkpoint is automatically generated. Checkpoints that you create before you install this patch do not work after you install the patch. The following file is available for download from the Microsoft Download Center:

mip://02373570/default.aspx?scid=http://download.microsoft.com/download/win me/update/16372/winme/en-us/290700usam.exe[GRAPHIC:] Download 290700usam.exe now

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