

# Web Media Blocks (Partial Web Deployment)

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## An InstallAware Whitepaper

March 2005



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 **INSTALLAWARE**

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## Introduction

InstallAware allows splitting the data contained inside a setup package into multiple online and offline parts. While web deployment traditionally involves putting the entire setup online, thus mandating an active web connection to install any part of the product, InstallAware sidesteps this artificial limitation and allows developers to precisely choose which parts of their setup are to be downloaded, and which are to be provided with the main setup program. This saves time and bandwidth not only for end users installing the applications, but also for companies hosting the downloads. Application runtimes which may already be present on end user systems, and typically bloat setup downloads, are ideal candidates to benefit from the web media blocks system. With web media blocks, they will only be downloaded if required, and the main setup is wholly self-contained, capable of executing an installation without requiring an active Internet connection.

## Web Media Blocks (Partial Web Deployment)

A unique feature of InstallAware v5, one that is unavailable in any other setup development tool, is the possibility of partial web deployment.

Traditionally, setups that are web deployed reside entirely online. The end-user downloads a very small stub that contains only the setup driver. The stub then connects to the Internet and downloads the entire remainder of the setup from the Internet. This approach definitely saves time in some cases – for instance, the stubs don't download runtime components, such as the .NET runtime, if they are already found on the end-user system. However, having to download the entire application from the web as well, in addition to the runtimes, is an inconvenience at best. Even if the end-user system already has the required runtimes, the setup will still require and force an Internet connection.

The other alternative is to pack every runtime, along with the application itself, into a self extracting installer which contains everything. However, the downside to this approach is that while the setup is completely self-contained, and thus installs without requiring an Internet connection, it is bloated and may already contain runtimes that the end-user already has. Especially in the case of larger runtimes, such as the .NET runtime, this bloat can far exceed the size of the main application itself, and frustrate users in that they have to download and wait for what they already have on their system. InstallAware has had the perfect answer to this dilemma since its very first version: web media blocks technology.

## Web Media Blocks

In InstallAware v5, setups are comprised of one or more web media blocks. A web media block is actually a script directive, very much like the compiler directives found in most programming languages. It tells the setup compiler how the setup is to be split into multiple online and offline pieces.



A web media block directive has two fields: the name of the web media block, and its download URL. The name of the web media block determines the name of the output file that is created for that web media block. This file name will typically be of the form <block name>.7zip. The download URL indicates where the installer can expect to find the web media block file at runtime, and can point to any HTTP, FTP, or network location. The default file name of the web media block can also be modified in the download URL. As long as the actual web media block file exists at the given location, the download will succeed.

There is also a special kind of web media block, called the offline block. If a web media block statement contains an empty name, that web media block is considered to be an offline block, and the download URL field is disabled. The installer does not create a separate file for an offline block, and instead packages everything inside the offline block into the main setup executable (hence, the “offline” block).

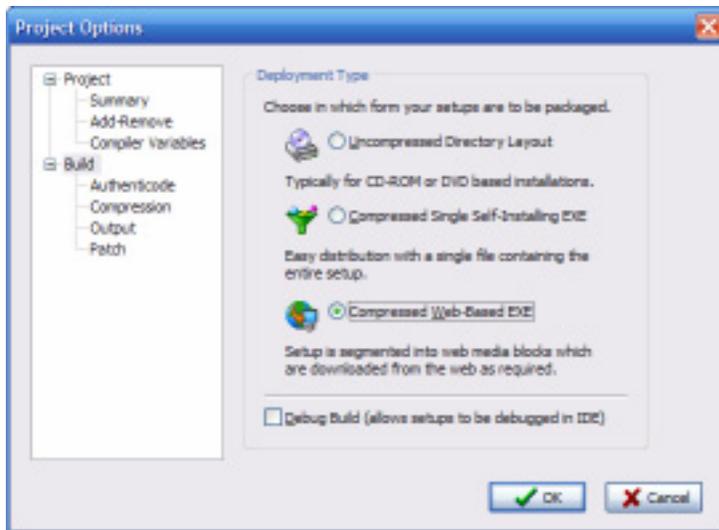
When InstallAware v5 builds your setup, it parses your script and identifies which files belong inside which web media blocks. A web media block directive has effect from the point of its declaration in the script up to the next web media block directive. Each installation command that requires source media, such as Install Files, becomes associated with the last declared web media block directive and the files for those commands are packaged into the web media block file defined by that directive, to be downloaded dynamically at runtime. You may declare an unlimited number of web media blocks in your setup script,

and also use identical declarations more than once, in this way precisely crafting the web deployment structure of your setup.

At runtime, when the setup script is executing on the end-user system, if an installation statement that falls inside a web media block executes, the installation engine attempts to download that web media block (if it has not been previously downloaded). If no statements that require access to source media (such as Install Files) execute inside a particular web media block, that web media block will not be downloaded. The download process is resilient and has the capability to resume after an interruption. Moreover, inside corporate environments where proxy servers are used, the download process automatically detects correct proxy settings and works seamlessly.

Web media blocks technology, only available with InstallAware, provides flexible, partial web deployment capabilities for the first time in setup development history. You may place each separate application runtime inside its own web media block, therefore preventing bloating the size of your main setup executable. You may also use this facility to separate rarely used or space consuming features of your application from the main setup file. And any part of your setup which is inside an offline block goes directly inside the main setup file, helping you build a self contained installer that works without demanding an Internet connection.

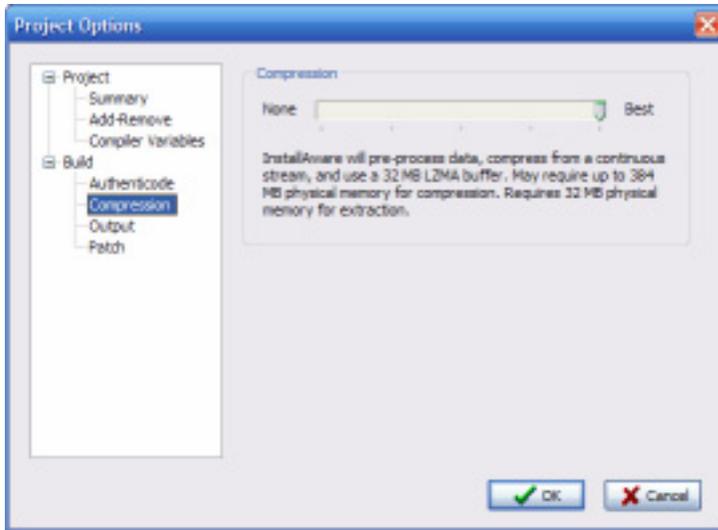
Splitting your application into web media blocks will not only save your users undue frustration, but it will also result in significant bandwidth savings for your business. Because large runtimes and optional features will be downloaded only when absolutely required, your servers will conserve bandwidth up to levels not possible before.



While every InstallAware setup script contains one or more web media blocks, the build process will generate web media blocks only if you are targeting the web (as configured in the Project Options dialog). If you are doing an uncompressed or compressed build, web media blocks will be excluded from the installation, and every part of your setup will be available as either a single monolithic compressed file, or a collection of uncompressed files and folders suitable for CD/DVD deployment. This adds an additional layer of convenience when you are targeting multiple types of distribution media and avoids the tedium of having to manually modify your setup script for each different output type.

## ***Superior Compression***

In tandem with its unique web media blocks technology, InstallAware v5 provides a revolutionary form of compression that works nothing short of miracles in reducing file sizes. InstallAware v5 expands on the abilities of its previous versions and goes even further in reducing download times and sizes.



Compression settings are configured in the Project Options dialog, and five levels of compression are available, with a sliding scale from none to best. The best compression mode utilizes a very advanced data processing algorithm that pre-processes all files using Binary Call Jump Converters (version 2), thus increasing their compressibility; and then passes the optimized data streams through a LZMA encoder with a 32 MB compression buffer.

InstallAware’s compression speaks for itself. The following table lists size gains for several popular application runtimes after being processed by InstallAware:

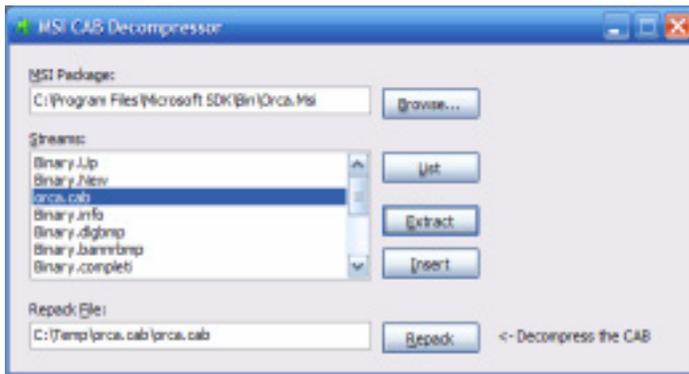
Runtime	Compressed Size	InstallAware Size	Compression Gains
Windows Installer	3,446 KB	1,770 KB	49%
Internet Explorer 6	79,849 KB	47,110 KB	41%
Microsoft .NET 1.1	23,697 KB	12,338 KB	48%
Microsoft JSharp	6,764 KB	2,596 KB	61%

Notice that the compression gains listed in the table above are over the already compressed sizes of the runtimes. In most cases, InstallAware reduced more than half in size what was already the compressed size of the runtime.

Similar compression benefits will carry over to your own program files as well, creating the smallest possible installers available today.

## Repacking Databases

While the examples above imply that it is possible to re-compress pre-compressed data, this is not the case. No matter how good a data compression algorithm is, because of the law of entropy in data compression theory, it cannot recompress data that has been compressed before, even if the prior algorithm was an inferior one. Therefore, InstallAware actually comes with de-compressed copies of the runtimes in the list above (among others), and it is these runtimes which it compresses to half the size of the original compressed sizes. But what about your own runtimes and program files?



When you are trying to take advantage of the superior compression that is provided by InstallAware, you should make sure that none of the source files going into your setup are pre-compressed. For instance, do not use EXE-packers, which reduce your executable program size, with InstallAware setups – because while the EXE sizes will indeed be reduced with the EXE-packer, they will be reduced to even less of a size if you let InstallAware compress them from scratch.

There might also be cases in which you include MSI and MSM Windows Installer databases in your setup, to install additional components or dependencies. Unfortunately, MSI and MSM databases generally contain compressed data streams within them, and of course, even though the native Windows Installer compression is inferior (CAB-MSZIP/CAB-LZX), InstallAware will be unable to further compress this data because it has already been compressed.

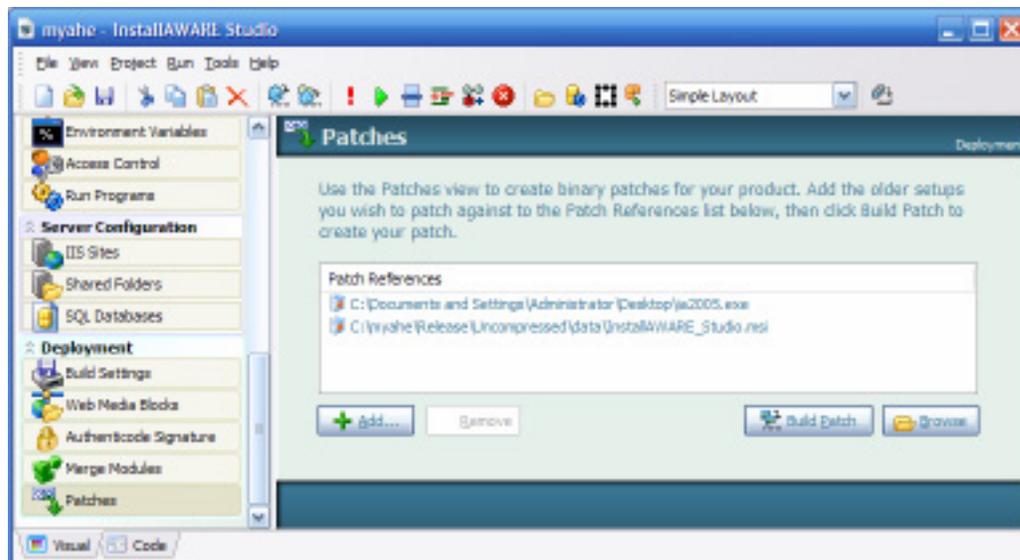
InstallAware v5 provides a new tool, the MSI CAB Decompressor, which you can use to repack these installation databases. This tool opens MSI and MSM databases, and updates the compressed data they contain with the exact same data in uncompressed form. This allows InstallAware's superior LZMA/BCJ2

algorithm to work miracles in re-compressing all the data that is found inside the Windows Installer databases.

Whenever you add an MSI or MSM database to your installation, be sure to process it first with the MSI CAB Decompressor tool.

## ***One-Click Patching***

No matter how good the compression you use, and how many web media blocks you split your setup into, the time inevitably comes when you need to issue an update to your end-users, and you just cannot afford to resend a complete installer. This is especially the case when a relatively minor number of files have been updated for a relatively small number of changes and bug fixes in your application, and you just want to update those files – instead of re-distributing the entire setup from scratch.



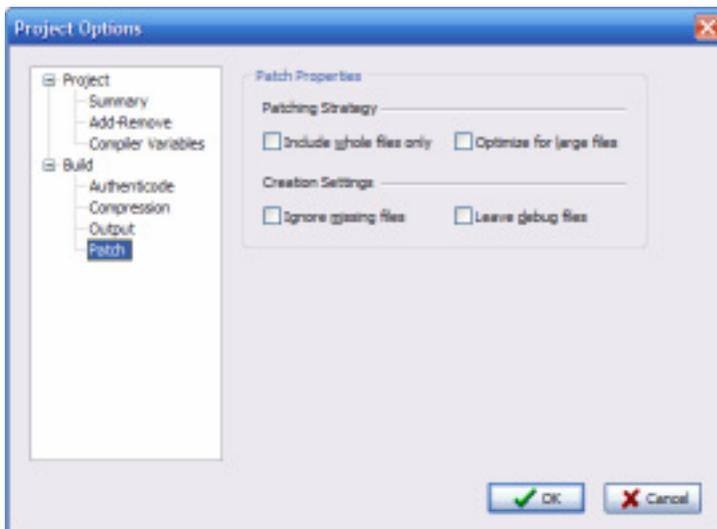
InstallAware v5 introduces the novel one-click patching feature to address this need. To use one-click patching, just include its latest set of files in your setup as before. Then, add the installers for the previous versions of your product to your setup project as Patch References (only add the installs that you wish to support patching against). When you click the Build Patch button, InstallAware does the following, all automatically, with no manual intervention or supervision on your part:

1. Builds the latest version of your application setup

2. Extracts the referenced previous versions of your application setups (if compressed), to a temporary working folder
3. Compares the current version of your setup with the previous versions
4. Invokes the Windows Installer engine to generate a native Windows Installer patch file
5. Repacks the native Windows Installer patch file with superior compression

InstallAware takes care of all the dirty work in patch creation for you. Unlike other leading commercial products, no upgrade syncing, no patch compatibility testing, and no pre-flight deployment testing is required. InstallAware patches take truly one-click to create, and they just work, without complications.

The created patches contain the absolute minimum data and files that are required to upgrade your old versions to the newest version. This is made possible by taking binary/differential scans of the files in your different versions, and examining them. Only the changes between the different versions are included in the patch. Even when patching very large applications, the output patch files will be very small – dramatically simplifying patch distribution and reducing your costs.



Further patch creation options, such as using full files instead of storing binary/differential patch data, are also available in the Project Options dialog.

## ***Corporate Deployment***

One of the main reasons Windows Installer rapidly became a corporate standard is its ease of deployment. If you are managing thousands of workstations on your corporate network, it is simply out of the question to manually install applications on all those workstations. Instead, you have to automate the deployment process. Windows Installer has been adopted rapidly in large organizations because it lends itself very cleanly to such types of mass deployment and maintenance.

Installations created with InstallAware have always supported silent installations, along with a configurable set of command line parameters for specifying advanced installation settings. What's more, in addition to the standard configurability provided by Windows Installer, InstallAware installations can define their own custom command line parameters and give systems administrators even more automated deployment options. Setups execute completely silently in the background and also provide logging options for post-mortem diagnostics in case of complications with the deployment procedure.

Even better, the Web Media Blocks technology uniquely featured in InstallAware offers some very exciting opportunities when used in large organizations for deployment. If you specify your Web Media Block sources on corporate file servers (as opposed to Internet URLs), you get several advantages:

- Security: Setups will not run outside of the organization network, as the web media blocks will be accessible only on that network
- Versioning: Setups will always have access to the latest version of setup sources, since the centralized web media blocks will always contain the most up to date files
- Patching: Especially for patches that require access to source media (a problem that makes patch deployment a nightmare in large environments), web media blocks provide automatic source resolution, even across different versions of the same product

In the true InstallAware tradition, InstallAware v5 takes corporate deployment one step further with the additional features and functionality it offers, on top of those already provided by Windows Installer – saving you time and money with its advanced deployment mechanisms.



## Summary

Built from the ground up, InstallAware v5 achieves what no other installation development environment can, providing you with state-of-the-art tools that save you time and effort while building modern application installations. InstallAware v5's unique Web Media Blocks technology makes InstallAware v5 the ultimate setup development solution.

## About InstallAware Software Corporation

InstallAware Software Corporation was founded by InstallShield alumni in 2003. The company focuses on software installation technologies for the Windows Installer platform and brings a fresh approach to the setup development process. The privately held company has received numerous seed investments from venture capital firms and is a Borland Technology Partner.

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