

# ZTSvc a Service for automatic Software Deployment

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## 1. Preface and Features

This paper discusses an idea of automatic software deployment for © Microsoft Windows (XP, W7, W8, W10) clients in a network environment. At the moment the Lightweight ZTSvc System offers the following features:

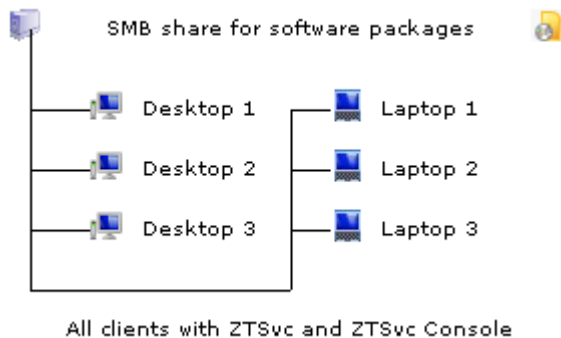
Feature	Description
Assigned Software Deployment	administrator assigns Software Packages to devices in the network
Available Software Deployment	user may choose from a list of available Software Packages
Fast Software Deployment	- Assigned Deployment starts immediately after reboot - Available Deployment starts ~ 1 min after change
Defined Install Order	Define install order for dependend Software Packages
Software Deployment from share	all Software Packages reside on a SMB share, no need of local cache
Controlled Windows Update Service	while Software Installation Windows Update Service will be paused
Inventory	All installed Software Packages and basic WMI queries
Simple Installation	MSI package to install <code>ztsvc.exe</code> , <code>ztsvc.dll</code> and <code>ztwin.exe</code>

## 2. Prerequisites

To test the ZTSvc components you will need the following prerequisites:

- Client Computer(s) with ZTSvc installed (Desktop or Laptop)
- SMB share on a Windows Server or Windows Desktop
- at least one `Install.cmd` that performs an unattended Software Installation

The software packages reside on a SMB share and have to be prepared for unattended installation.



Most software provides `/silent`, `/s`, `/q...` switches for that purpose.

In the case of a MSI installation refer to the command line switches of `msiexec`.

e.g. `msiexec /package xy.msi /passive /norestart`

**Be sure to test your scripts carefully to get a reliable automatic software deployment!**

### 3. Installation and Configuration of ZTSvc

For the installation of `ztsvc.exe`, `ztsvc.dll` and `ztwin.exe` it is recommended to use the MSI file `ztsvc.msi` with the following public properties:

Property	Example	Description
INSTALLDIR=	%SystemRoot%\ZTS	This is the default install directory which you may change with this property.
UNCP=	\\server.domain.net\zts	UNC path the service will connect to install software from
NDRV=	P:	This is the default drive name which you may change with this property.
USER=	domain\ztsvc	Domain name\user name to connect (validate against) UNC path
PSWD=	password	Password for user name

You may use `Install.cmd` to install `ztsvc.msi` (first uninstall previous Versions then the new one):

```
msiexec /x {CB0A5A36-BBBF-4057-A5AB-532CD6006278} /passive
```

```
msiexec /package ztsvc.msi UNCP="\\server.domain.net\zts" USER="domain\ztsvc"
PSWD="1234" /passive
```

Perform this command line with Administrator privileges

("run as Administrator"). After the installation of `ztsvc.msi` the service will start automatically. If you uninstall `ztsvc.msi` the service will be stopped automatically and removed from the service list.

Here are some extra commands to control the service, but you should not need them:

Command	Description
<code>ztsvc /install</code>	registers the service in SCM (service starts with system)
<code>ztsvc /start</code>	starts the service manually
<code>ztsvc /stop</code>	stops the service manually
<code>ztsvc /uninstall</code>	delete the service from SCM (Service Control Manager)

The configuration of ZTSvc resides in the registry:

HKLM\SOFTWARE\Coopware\ZTSvc (for the x86 System)

HKLM\SOFTWARE\WOW6432Node\Coopware\ZTSvc (for the x64 System)

The following table describes the parameters of ztsvc:

Command	Description
stop	stops the service after the first task (default 0, the service keeps running)
tmax	maximal time in seconds for one package installation if this value exceeds the current process is terminated (default 1800 = 30 min)
tmsg	time in seconds to display a message with the ongoing package installation to the active windows session (if no user is logged on) (default 5, if 0 no message will be displayed)
tsvc	time in seconds to wait for the next software install request (default 60 = 1 min)
twrb	time in seconds to wait for a System Reboot (if required after a deployment) (default 120 = 2 min)

## 4. Software Deployment with ZTSvc

ZTSvc is designed to deploy software (packages) in the context of the local system automatically.

Software deployment will be configured with the local file `ztsvc.ini`

Operating System	Value
Windows XP	Common AppData\ztsvc.ini from registry
Windows 7/8/10	%PUBLIC%\ztsvc.ini from environment

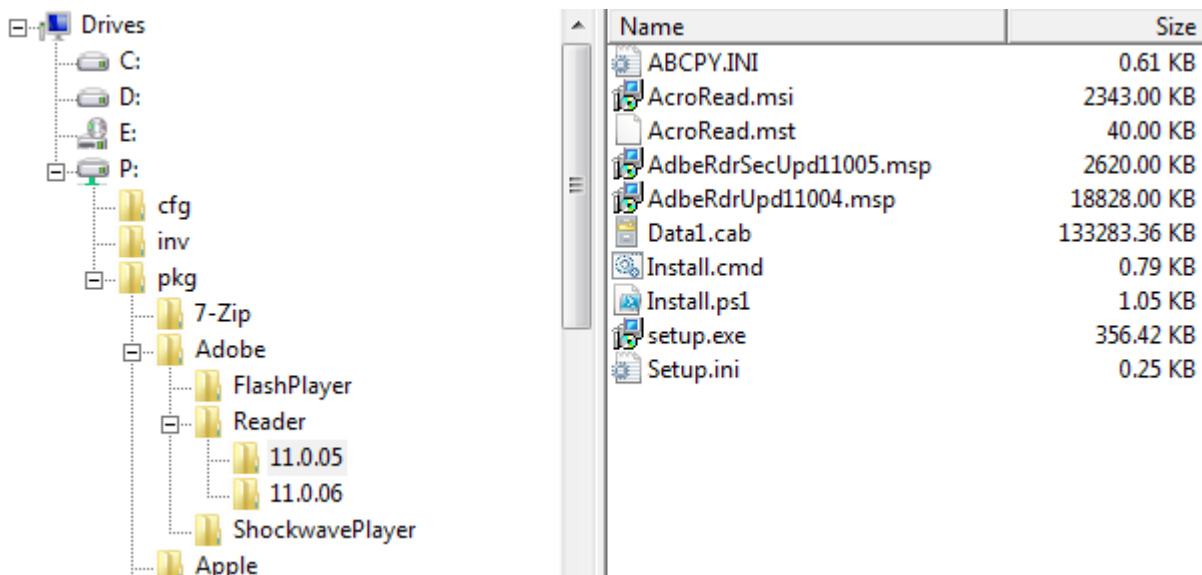
On Microsoft Windows XP you have to assign **write access to ztsvc.ini** for the local user group, if you want to allow all users to install Software Packages (available Deployment).

It is recommended that you organize your software packages in a hierarchical structure with **three** levels in the following **new** schema:

```

Drive (local or network)
  |_cfg (for config files)
  |_inv (for inventory data)
  |_pkg (for software packages)
        |_Manufacturer
              |_Name
                    |_Version

```



This schema allows an automatic detection of software packages (script name must be `Install.cmd`) with [ZTSvc Console](#) described later in this text.

A package is the abstraction of one software product and is stored in the following format:

```
[Company Name]
comp=Company or Manufacturer of the software
name=Name of the software
path=Path to the script to install the software unattended (silent)
vers=Version String
```

An example:

```
[Adobe Reader]
comp=Adobe
name=Reader
path=P:\Adobe\Reader\10.1.4\Install.cmd
vers=10.1.4
```

Inside of `Install.cmd` the following lines ensure an unattended installation:

```
@echo off
  set errorlevel=
  set exitcode=0
  msexec /package AcroRead.msi TRANSFORMS=AcroRead.mst /passive /norestart
  if not "%errorlevel%" == "0" set exitcode=%errorlevel%
  exit /b %exitcode%
```

ZTSvc is a 32 bit application. It will also install 64 bit software packages. If you have troubles installing 64 bit software you might use the following trick which starts a 64 bit commandline from a 32 bit process:

```
if "%PROCESSOR_ARCHITECTURE%"=="x86" goto native
call %SystemRoot%\Sysnative\cmd.exe /c %0 %*
exit /b

:native
  install 64bit command here
```

## The Process of Software Deployment

Before the service starts the software deployment task pauses the local windows update service (`wuactl`) to avoid interferences while installing software. Then when the task is finished `ztsvc` will resume windows update service to continue.

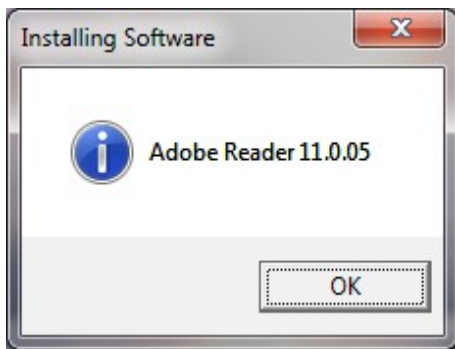
The service reads one section in `ztsvc.ini`. Next the service looks for footprints of the package in the registry (`HKLM\SOFTWARE\Coopware\ZTsvc\Packages`). If the corresponding parameters are not found (first installation) or the version in the registry does not match (update) the service will execute the script specified with `path`.

The package script (`path`) can be executed from a local or from a network drive. To connect the network drive automatically the service will perform a `WNetAddConnection` call with the service parameters `uncp`, `ndrv`, `user`, `pswd`.

Before the script is executed the service will do the following:

**a) if no user is logged on:**

send a Message to the active session for `tmsg` seconds (If `tmsg = 0` no message will be displayed.):



**b) if a user is logged on:**

start ZTWin and display the current package (green icon, see images later in this text)

A successful execution of the package script in the context of the service (`local system`) is reported to the registry.

**Note:** If the script exits with an error code the parameter `vers` will not be saved in the registry to allow an installation at the next version check. This can be after `tsvc` seconds or after the next reboot.

If the scripts exits with the errorlevel `code=1641` or `code=3010` (this indicates a required MSI reboot) the Version `vers` will be saved in the registry. The services accumulates the reboot request and will then (at the end of the software deployment task) display a message ("*The previous software deployment task needs a System Reboot!*") for `twrp` seconds and automatically perform a reboot.

(Standard)	REG_SZ	(Wert nicht gesetzt)
code	REG_DWO...	0x00000000 (0)
path	REG_SZ	P:\pkg\Adobe\Reader\11.0.05\Install.cmd
time	REG_SZ	2014-02-02 16:48:00
vers	REG_SZ	11.0.05

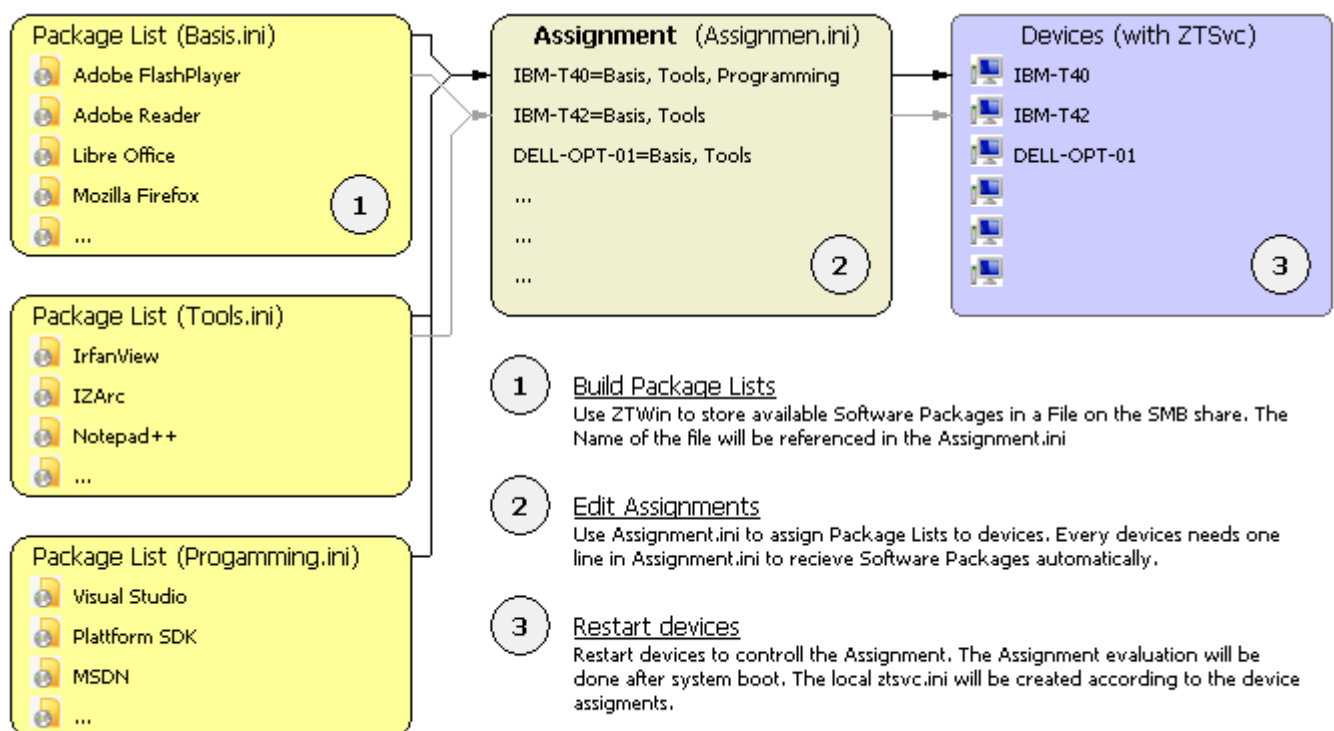
The service `ztsvc.exe` writes the logfile `ztsvc.log`. A successful software deployment will leave entries like this:

```

2014-02-02 16:48:09 Service started by command
2014-02-02 16:48:09 Service started
2014-02-02 16:48:09 Service running tmax=1200s tmsg=5s tsvc=60s stop:0
2014-02-02 16:48:10 Configuration: C:\Users\Public\ztsvc.ini
2014-02-02 16:48:15 CNet::WNetAddConnection (P:) OK ...
2014-02-02 16:48:15 CMsg::WTSGetActiveConsoleSessionId () returned: 0x0000007a
id: 1
2014-02-02 16:49:15 CMsg::WTSSendMessage () returned: 0x00000000
code: 0x00000001
2012-02-02 17:00:11 CPrc::CreateProcess (P:\pkg\Adobe\Reader\11.0.5\Install.cmd,
P:\Adobe\Reader\10.1.4) returned: 0
2014-02-02 17:00:11 CNet::WNetCancelConnection (P:) OK ...
2014-02-02 17:00:13 Service stopped

```

## Assigned Software Deployment



The features of ZTSvc have been extended. The administrator can now assign single software packages or groups of software packages to devices. The new `cfg` Directory is used to store additional `*.ini` Files. The most important File is `Assignment.ini` which maps devices to Packages or Package Groups. Use Notepad to create and edit this file (Encoding: ANSI).

You may mix Assigned and Available Software Deployment. However, the assigned software packages will always overwrite the available selection at system start.

Package Lists can be created starting `ztwins /admin`  
See Introduction to ZTSvc Console in the next chapter.

## Available Software Deployment

With the small ZTWin console the user may find and select software packages in a self service mode.

See Introduction to ZTSvc Console in the next chapter.

## 5. Introduction to ZTSvc Console

If you read until here you should be familiar with the basic concept of software deployment with ZTSvc. To assist you with the configuration of `ztsvc.exe` and the creation of `ztsvc.ini` or Package List files in the expected format you may use ZTSvc Console (`ztwin.exe`).

ZTSvc Console has a dual functionality:

1. Client Console to show software deployment progress, configuration and inventory  
Try File/Show Assignments for this Device to get a HTML Report for assigned Packages.
2. Admin Console (with the `/admin` switch) to create and edit new Package Lists. Try the Admin Menu with "Open Package List" and "Save Package List". To delete Packages from your list use the Delete Button.
  - ▼ ▲ Use these buttons (move down/up) to change the install order of a package installation (especially if you have dependencies between packages).

Select the root of the tree. ZTSvc Console reads the service configuration from the registry and will display it in a list. If the service has not been configured you may do it with a double click on the configuration item (e.g. UNC Path).

### 1. Configure the service ZTSvc with ZTSvc Console

The screenshot shows the ZTSvc Console interface. On the left is a tree view with 'ZTSvc' selected, containing folders for 'Packages', 'Inventory', and 'Software.csv'. On the right is a table displaying the service configuration:



Name	Value
UNC Path	\\zts-server\zts-share
Drive	P:
User	domain\zts-user
Password	*****
<input type="checkbox"/> Stop service after first task	0
Time max. package installation [s]	1800
Time to display a message [s]	5
Time to wait for next task [s]	60
Time to wait for System Reboot [s]	120














Below the table is the 'ZTSvc Configuration' dialog box, which mirrors the configuration values shown in the table:

UNC Path: \\zts-server\zts-share  
 Drive: P:  
 User: domain\zts-user  
 Password: \*\*\*\*\*  
 Stop service after first task  
 Time max. package installation [s]: 1800  
 Time to display a message [s]: 5  
 Time to wait for next task [s]: 60  
 Time to wait for System Reboot [s]: 120  
 OK










## 2. Concept of the available Software Deployment








Press  and wait while ZTWin is searching for available Software Packages. (All Scripts have to be named *Install.cmd!*) Then select the Packages you want to be installed by ZTsvc and the press . If (stop=0) the service will read the new saved ztsvc.ini and start to install. If (stop=1) the service will install after a reboot.

Name	Manufacturer	Version	Script	Status
 FlashPlayer	Adobe	12.0.0.77	P:\pkg\Adobe...	ready to install
 Reader	Adobe	11.0.05	P:\pkg\Adobe...	ready to install
 ShockwavePlayer	Adobe	12.1.0....	P:\pkg\Adobe...	ready to install
 LibreOffice	AOB	4.2.4	P:\pkg\LibreO...	ready to install
 Firefox	Mozilla	28.0	P:\pkg\Mozilla...	ready to install
 JRE	Oracle	7u51	P:\pkg\Oracle...	ready to install
 VLC	VideoLAN	2.1.3	P:\pkg\VideoL...	ready to install
 MSDN	Microsoft	6.0	E:\Install\Micr...	available
 Plattform SDK	Microsoft	3790	P:\pkg\Micros...	available
 Visual Studio	Microsoft	6.0	E:\Install\Micr...	available
 Eclipse	Oracle	juno-SR2	P:\pkg\Oracle...	available
 JDK	Oracle	7u17	P:\pkg\Oracle...	available
 7-Zip	AOB	9.20	P:\pkg\7-Zip}...	available

While the Software Deployment Task watch the installation progress ...

Name	Manufacturer	Version	Script	Status
 FlashPlayer	Adobe	12.0.0.77	P:\pkg\Adobe...	successfully installed
 Reader	Adobe	11.0.05	P:\pkg\Adobe...	successfully installed
 ShockwavePlayer	Adobe	12.1.0....	P:\pkg\Adobe...	successfully installed
 LibreOffice	AOB	4.2.4	P:\pkg\LibreO...	currently installing ...
 Firefox	Mozilla	28.0	P:\pkg\Mozilla...	ready for install
 JRE	Oracle	7u51	P:\pkg\Oracle...	ready for install
 VLC	VideoLAN	2.1.3	P:\pkg\VideoL...	ready for install

After the Software Deployment Task click on Packages to update Status

Name	Manufacturer	Version	Script	Status
 FlashPlayer	Adobe	12.0.0.77	P:\pkg\Adobe...	2014-05-10 20:00:00
 Reader	Adobe	11.0.05	P:\pkg\Adobe...	2014-05-10 20:01:10
 ShockwavePlayer	Adobe	12.1.0....	P:\pkg\Adobe...	2014-05-10 20:04:20
 LibreOffice	AOB	4.2.4	P:\pkg\LibreO...	2014-05-10 20:12:00
 Firefox	Mozilla	28.0	P:\pkg\Mozilla...	2014-05-10 20:15:30
 JRE	Oracle	7u51	P:\pkg\Oracle...	2014-05-10 20:17:00
 VLC	VideoLAN	2.1.3	P:\pkg\VideoL...	2014-05-10 20:20:30

## Appendix

List of successfully deployed Software on a Windows 7 (64 bit) Client with ZTSvc:

1. Adobe Flash Player 11.8.800.175
2. Adobe Reader 11.0.07
3. Adobe Shockwave Player 12.1.3.153
4. Apple iTunes 11.1.5
5. Apple QuickTime 7.7.5
6. Autodesk AutoCAD 2013 (64 bit)
7. CDBurnerXP 4.5.4
8. CorelDRAW Graphics Suite X7.1 (64 bit)
9. Gimp 2.8.8
10. Google Chrome 31.0.1650.63
11. Google Earth 7.1.2.2041
12. Helios TextPad 7.4.0 (64 bit)
13. IBM SPSS Amos 21.0.0.0
14. IBM SPSS Statistics 21.0.0.1
15. IZArc 4.1.8
16. Java Runtime Environment 7.0.600
17. Java Runtime Environment 8.0.50
18. Kubit PhoToPlan 9.0.4.2
19. LibreOffice 4.2.5
20. McNeel Rhino 5.0
21. McNeel Flamingo
22. Microsoft Office 2013 SP1
23. Microsoft Project 2013 SP1
24. Microsoft Visio 2013 SP1
25. Microsoft Visual Studio 2013 Premium
26. MiKTeX 2.9 (64 bit)
27. Mozilla Firefox 33 de
28. Notepad 6.6.9
29. PDF Creator 1.7.3
30. Putty 0.63
31. TeXnicCenter 2.0.2
32. VLC media player 2.1.3
33. Xming 7.5.0.82