

ZTSvc a Service for automatic Software Deployment

v. 1.0.0.8, 2018.08.18

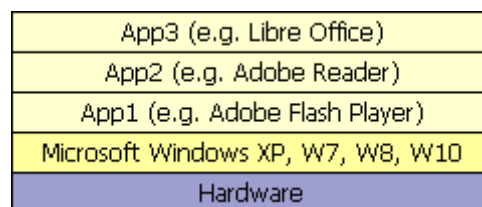
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1. Preface and Features

This paper discusses an idea of automatic software deployment for © Microsoft Windows (XP, W7, W8, W10) clients in a network environment. The main purpose is to automatically build a stable and reliable software stack on Microsoft Windows:



In detail the following features are supported at the moment:

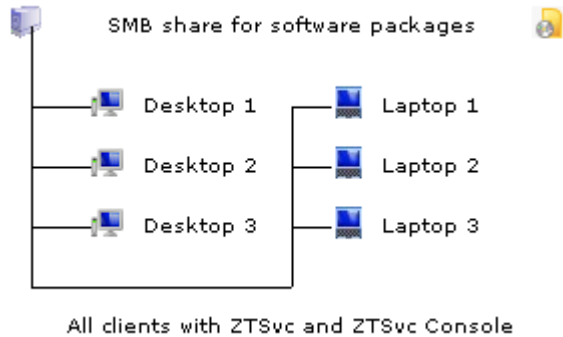
Feature	Description
Assigned Software Deployment	administrator assigns Software Packages to devices in the network
Available Software Deployment	user may choose from a list of available Software Packages
Fast Software Deployment	- Assigned Deployment starts immediately after reboot - Available Deployment 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 registry queries
Simple Installation	MSI package for ztsvc.exe, ztsvc.dll, ztinv.exe and ztwin.exe
Tasks	Scheduled Tasks in the context of system or current user

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 installers provide switches (`/q`, `/s`, `/silent` ...) for that purpose.

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

e.g. `msiexec /package xypad.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 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 {CBOA5A36-BBBF-4057-A5AB-532CD6006278} /passive // Version 1.0.0.6  
msiexec /x {C00ABCDE-2018-0818-1008-A0B1C2D3E4F5} /passive // Version 1.0.0.8
```

```
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 /delete</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)
tin	Inventory time cycle in hours (default 0, inventory only after reboot, 1 every hour, 2 every second hour, ...)
tmax	maximal time in minutes for one package installation if this value exceeds the current process is terminated (default 30) 30
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)
trst	time when the services will initialize a system reboot or shutdown (default 24:00 = never)
tsdd	day when the services will initialize a system shutdown (default 0 = never)
twrs	time in seconds to wait before reboot or shutdown (default 60)

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`

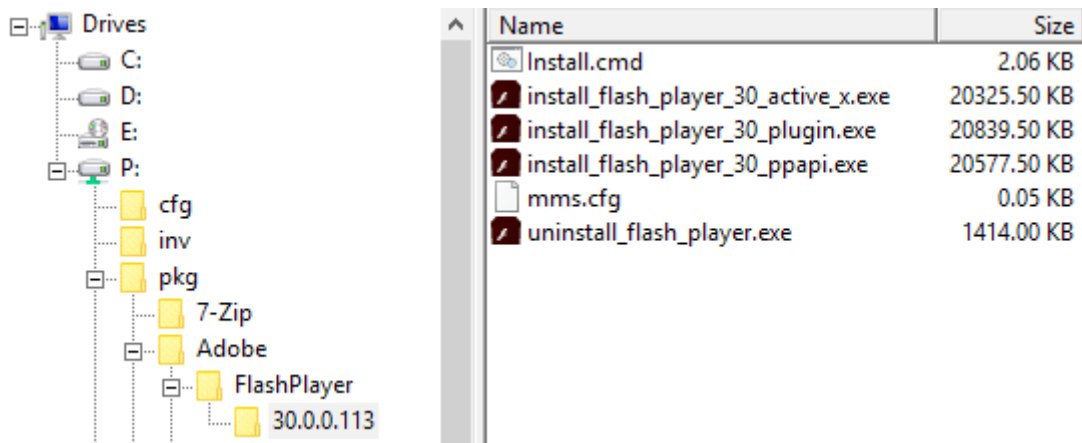
Operating System	Value
Windows XP	Common AppData\ztsvc.ini
Windows 7/8/10	%PUBLIC%\ztsvc.ini

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 **four** 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 Publisher 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 FlashPlayer]
comp=Adobe
name=FlashPlayer
path=P:\Adobe\FlashPlayer\30.0.0.113\Install.cmd
vers=30.0.0.113
```

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

```
@echo off
  set errorlevel=
  set exitcode=0
  install_flash_player_30_plugin.exe -install
  if not "%errorlevel%" == "0" set exitcode=%errorlevel%
  install_flash_player_30_ppapi.exe -install
  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 command line from a 32 bit process:

```
if "%PROCESSOR_ARCHITECTURE%"=="x64" 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.

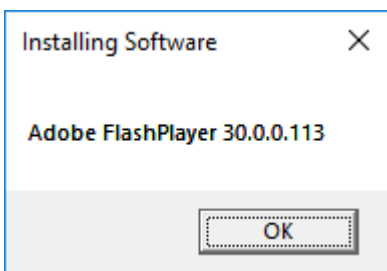
The service reads one section in `ztsvc.ini`. Next the service looks for footprints of the package in the registry (`HKLM\SOFTWARE\Coopware\ZTsvc\Packages`). If the corresponding parameters are not found (first installation) or the version in the registry does not match (update) the service will execute 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 60 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 Reboot!*") for `twrs` seconds and automatically perform a reboot.

Name	Typ	Daten
 (Standard)	REG_SZ	(Wert nicht festgelegt)
 code	REG_DWORD	0x00000000 (0)
 path	REG_SZ	P:\pkg\Adobe\FlashPlayer\30.0.0.113\Install.cmd
 time	REG_SZ	2018-06-13 09:01:45
 vers	REG_SZ	30.0.0.113

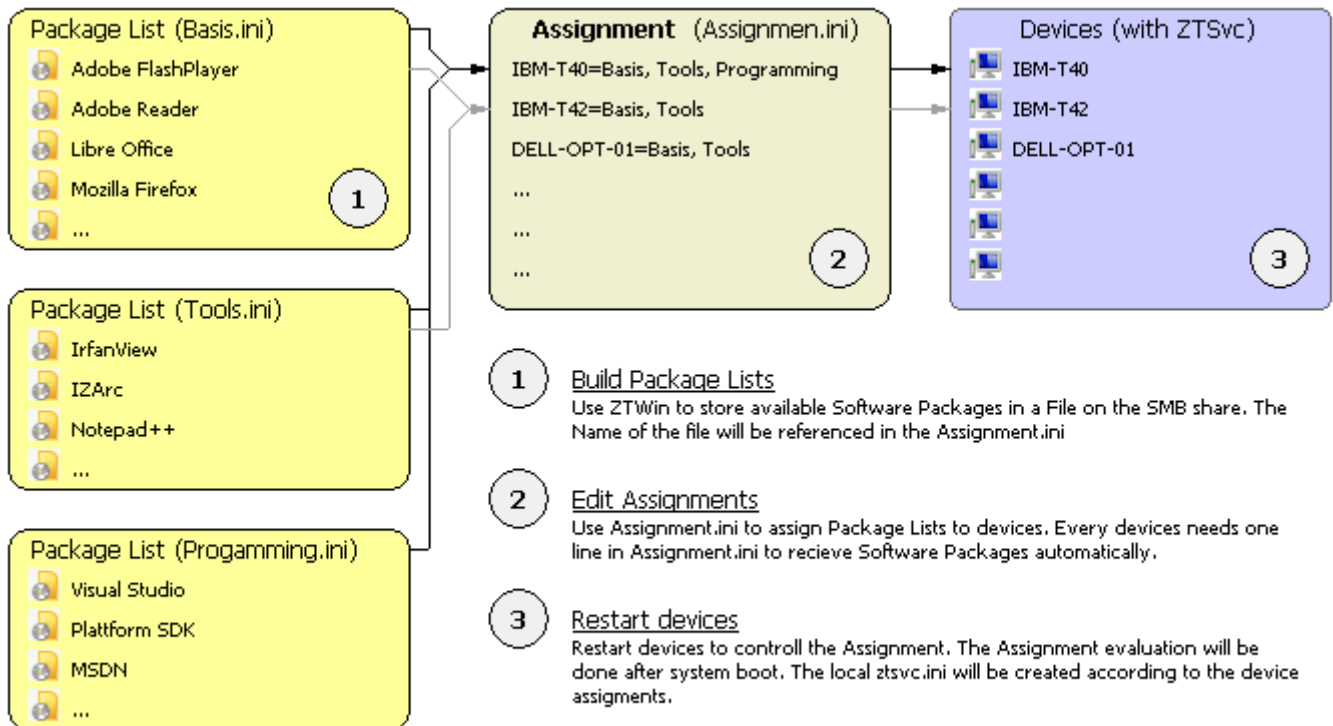
The service ztsvc.exe writes the logfile ztsvc.log. A successful software deployment will leave entries like this:

```

2018-08-12 13:34:26 C:\Windows\ZTS
2018-08-12 13:34:26 Service started
2018-08-12 13:35:26 Service running stop:0 tinv=0h tmax=20min tmsg=5s trst=2400
2018-08-12 13:35:30 CNet::CNet () OK ...
2018-08-12 13:35:30 CWup::CWup () OK ...
2018-08-12 13:35:30 CWup::pause_wup () OK ...
2018-08-12 13:35:30 C:\Users\Public\ztsvc.ini
2018-08-12 13:35:30 CNet::WNetAddConnection (P:) OK ...
2018-08-12 13:35:30 CUsr::WTSGetActiveConsoleSessionId () returned:0x0000007a ...
2018-08-12 13:35:10 CPrc::CreateProcess (P:\Adobe\FlashPlayer\30.0.0\Install.cmd
2018-08-12 13:36:20 CNet::WNetCancelConnection (P:) OK ...

```

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 th 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`).

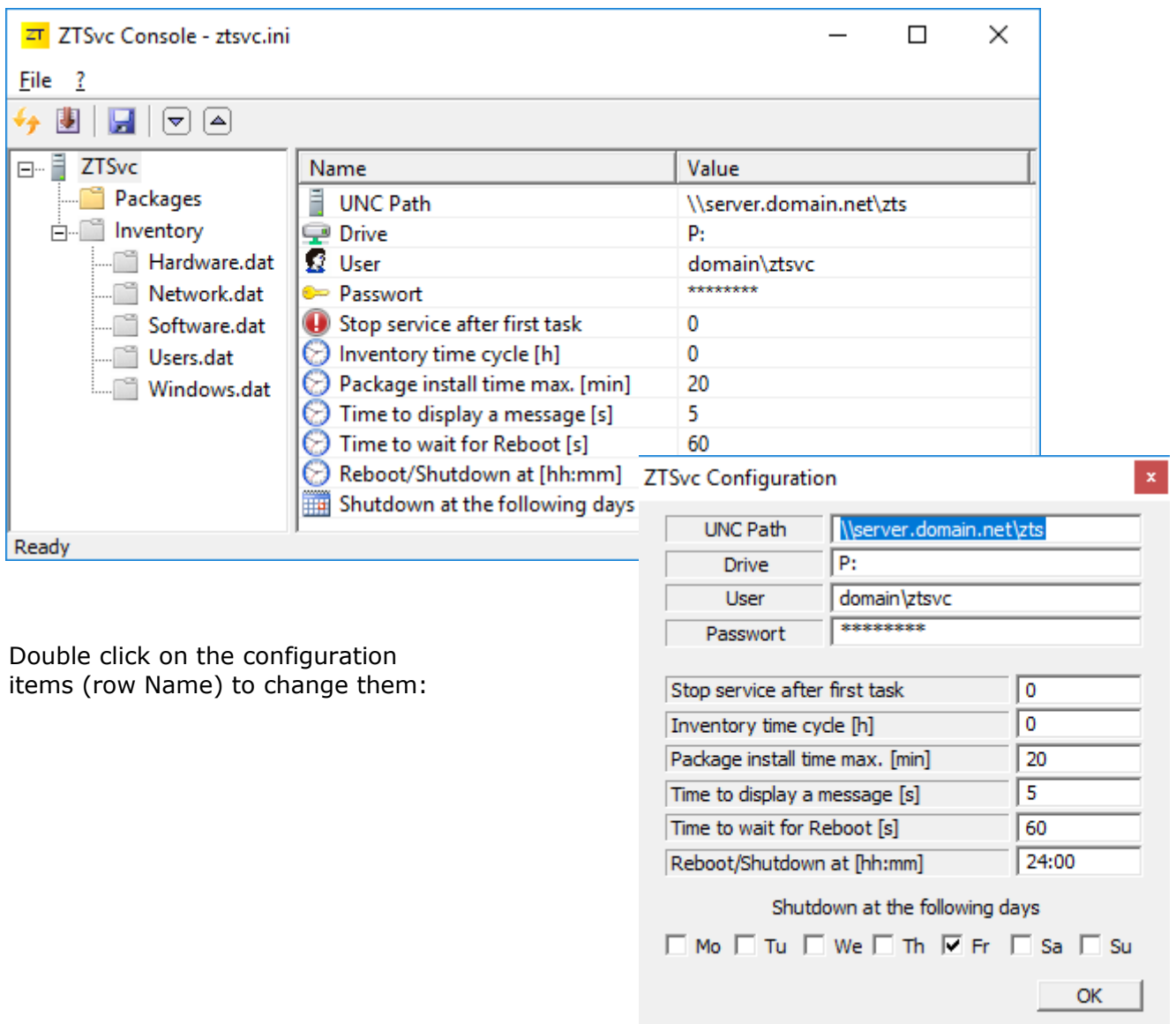
ZTSvc Console has a dual functionality:

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 the up and down buttons 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 application window. The main window displays a tree view on the left with folders for 'Packages', 'Inventory', and 'Hardware.dat', 'Network.dat', 'Software.dat', 'Users.dat', and 'Windows.dat'. The main area shows a table of configuration items:



Name	Value
UNC Path	\\server.domain.net\zts
Drive	P:
User	domain\ztsvc
Password	*****
Stop service after first task	0
Inventory time cycle [h]	0
Package install time max. [min]	20
Time to display a message [s]	5
Time to wait for Reboot [s]	60
Reboot/Shutdown at [hh:mm]	
Shutdown at the following days	











A configuration dialog box titled 'ZTSvc Configuration' is open, showing the same configuration items in a form:

UNC Path	\\server.domain.net\zts
Drive	P:
User	domain\ztsvc
Password	*****
Stop service after first task	0
Inventory time cycle [h]	0
Package install time max. [min]	20
Time to display a message [s]	5
Time to wait for Reboot [s]	60
Reboot/Shutdown at [hh:mm]	24:00
Shutdown at the following days	
<input type="checkbox"/> Mo	<input type="checkbox"/> Tu
<input type="checkbox"/> We	<input type="checkbox"/> Th
<input checked="" type="checkbox"/> Fr	<input type="checkbox"/> Sa
<input type="checkbox"/> Su	






Double click on the configuration items (row Name) to change them:

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	Publisher	Version	Script	Status	Order
 FlashPla...	Adobe	30.0.0.113	P:\pkg\Ad...	ready to in...	000
 Shockwa...	Adobe	12.3.4.204	P:\pkg\Ad...	ready to in...	001
 Reader	Adobe	11.0.12	P:\pkg\Ad...	ready to in...	002
 Firefox	Mozilla	60.0.2	P:\pkg\Mo...	ready to in...	003
 LibreOffi...	AOB	6.0.4	P:\pkg\Lib...	ready to in...	004
 IfanView	AOB	4.50	P:\pkg\Irf...	available	005
 IZArc	AOB	4.1.8	P:\pkg\IZA...	available	006
 Notepad...	AOB	7.5.4	P:\pkg\No...	available	007
 VLC	VideoLAN	3.0.3	P:\pkg\Vid...	available	008
 XYPad	Coopware	1.1.0.4	P:\pkg\Co...	available	009






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

Name	Publisher	Version	Script	Status	Order
 FlashPla...	Adobe	30.0.0.113	P:\pkg\Ad...	successfully installed	000
 Shockwa...	Adobe	12.3.4.204	P:\pkg\Ad...	successfully installed	001
 Reader	Adobe	11.0.12	P:\pkg\Ad...	currently installing ...	002
 Firefox	Mozilla	60.0.2	P:\pkg\Mo...	ready for install	003
 LibreOffi...	AOB	6.0.4	P:\pkg\Lib...	ready for install	004

After the Software Deployment Task click on Packages to update Status

Name	Publisher	Version	Script	Status	Order
 FlashPla...	Adobe	30.0.0.113	P:\pkg\Ad...	2018-06-23 20:00:00	000
 Shockwa...	Adobe	12.3.4.204	P:\pkg\Ad...	2018-06-23 20:01:00	001
 Reader	Adobe	11.0.12	P:\pkg\Ad...	2018-06-23 20:02:00	002
 Firefox	Mozilla	60.0.2	P:\pkg\Mo...	2018-06-23 20:03:00	003
 LibreOffi...	AOB	6.0.4	P:\pkg\Lib...	2018-06-23 20:04:00	004

Use Inventory Software.dat to control deployments ...

DisplayName	DisplayVersion	Publisher
 Adobe Flash Player 30 N...	Adobe Systems Incorporat...	30.0.0.113
 Adobe Flash Player 30 P...	Adobe Systems Incorporat...	30.0.0.113
 Adobe Reader XI (11.0.1...	Adobe Systems Incorporat...	11.0.12
 Adobe Shockwave Playe...	Adobe Systems, Inc.	12.3.4.204
 LibreOffice 6.0 Help Pac...	The Document Foundation	6.0.4.2

6. User Tasks and scheduled Reboot/Shutdown

Since ZTSvc Version 1.0.0.8 new features are available:

It is possible to register User Tasks in the HKLM Path of the Registry. This tasks are automatically executed in the context of the current user.

The current implementation of this feature supports time scheduled tasks from Monday to Friday between 00:00 and 23:99.

The configuration of the tasks is stored under (Example):

```
HKLM\Software\Coopware\ZtSvc\Tasks\09:00
"day"=dword:1 // sunday (su=1, mo=2, tu=4, wd=8, fr=16, sa=32)
"path"="C:\\Windows\\ZTS\\Test.cmd"
"typ"=dword:0 // context: system
```

```
HKLM\Software\Coopware\ZtSvc\UserTasks\16:00
"day"=dword:62 // monday - friday
"path"="C:\\Windows\\Notepad.exe"
"typ"=dword:1 // context: user
```

It is also possible to configure a scheduled Reboot/Shutdown with ZTWin.exe.

Appendix

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

1. Adobe Flash Player 30.0.0.113
2. Adobe Reader 11.0.12
3. Adobe Shockwave Player 12.3.4.204
4. Apple iTunes 12.7.3
5. Autodesk AutoCAD 2013 (64 bit)
6. CDBurnerXP 4.5.4
7. CorelDRAW Graphics Suite X7.1 (64 bit)
8. Gimp 2.8.8
9. Google Chrome 31.0.1650.63
10. Google Earth 7.1.2.2041
11. Helios TextPad 7.6.4 (64 bit)
12. IBM SPSS Amos 21.0.0.0
13. IBM SPSS Statistics 21.0.0.1
14. IZArc 4.1.8
15. Java Runtime Environment 8u172
16. LibreOffice 6.0.4
17. McNeel Rhino 5.0
18. McNeel Flamingo
19. Microsoft Office 2013 SP1
20. Microsoft Project 2013 SP1
21. Microsoft Visio 2013 SP1
22. Microsoft Visual Studio 2013 Premium
23. MiKTeX 2.9 (64 bit)
24. Mozilla Firefox 61.0.1 de
25. Notepad 6.6.9
26. PDF Creator 1.7.3
27. Putty 0.63
28. TeXnicCenter 2.0.2
29. VLC media player 3.0.3
30. Xming 7.5.0.82