



# ceterion Packaging Framework

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## Overview

The ceterion Packaging Framework has been developed to package Applications-Setups and deploying with several Deployment Systems. The cmPF is based on the "PowerShell App Deployment Toolkit 3.7.0" <http://psappdeploytoolkit.com/>.

It contains parts of the original toolkit and provides a number of extensions and changes. The modification includes for example a conversion from a simple included script into a PowerShell module and is extended with some additional functions and variables we missed in the original implementation.

## New Features

- Framework has been changed into a "Module" and therefore now provides all the benefits, that go with this. For Example
  - IntelliSense for commands and variables Context-sensitive
  - Online help (using F1 button)
  - Using "commands register" in PowerShell ISE and integrated command help
- Basic simplification, streamlining and updating
- Concept for abstraction of metadata and parameterization
- Simple parameter handling based on JSON-files
- Including encryption for passwords, license keys etc.
- Flexible, configurable naming scheme
- Package validation based on a configurable set of rules
- Advanced error handling and logging
- Renaming variables and functions
- Expansion of variables (already available during packaging)
- New commands and extensions in known commands
- Install multiple packages including reboots etc. without any deployment system for such as testing
- Support Citrix environments with automatic publishing, NTFS-Security and Start Menu population
- Support Deployment Systems like SCCM, ASG Cloud Shaper and many more
- Expandable with your own modules
- Small and clean installation scripts
- Package Folders and Installation scripts can be generated by command

## Optionally available

- SCCM/MECM Package Importer
- VMware Workspace ONE UEM Package Importer
- Create Task sequences based on templates
- Hundreds of templates for applications and operating system components (Adobe Reader, MS Office etc.)
- Packaging-Training for beginners and advanced users
- Citrix installation scripts with automated publishing



## System Requirements

Requirements on target systems:

- Windows PowerShell 5.1
- local admin rights on target system
- PowerShell execution policy (packaging)

System Requirements:

- like target system
- Editor with PowerShell support (e.g. Microsoft PowerShell ISE and/or Microsoft VS-Code)

## Licensing

The ceterion modular Packaging Framework is based on PowerShell App Deployment Toolkit and provided under the Microsoft Public License:

<https://msdn.microsoft.com/en-us/library/ff648068.aspx>

## New Functions, added by ceterion

- Add-Font
- Add-AppLockerRule
- Add-AppLockerRuleFromJson
- Add-Path
- Add-FirewallRule
- Add-FirewallRuleFromJSON
- Add-PermissionFromJson
- Convert-Base64
- ConvertFrom-AAPINI
- ConvertFrom-Ini
- ConvertFrom-IniFiletoObjectCollection
- ConvertTo-Ini
- Expand-Variable
- Get-EnvironmentVariable
- Get-FileVerb
- Get-Parameter
- Get-Path
- Import-RegFile

- Initialize-Script
- Install-DeployPackageService
- Invoke-Encryption
- Invoke-FileVerb
- Invoke-InstallOrRemoveAssembly
- New-File
- New-LayoutmodificationXML
- New-Package
- Remove-AppLockerRule
- Remove-AppLockerRuleFromJson
- Remove-EnvironmentVariable
- Remove-Font
- Remove-Path
- Remove-FirewallRule
- Remove-FirewallRuleFromJSON
- Remove-PermissionFromJson
- Set-AutoAdminLogon
- Set-DisableLogging
- Set-EnvironmentVariable
- Set-InstallPhase
- Start-NSISWrapper
- Test-IsGroupMember
- Test-Package
- Test-Package
- Test-PackageName
- Update-FilePermission
- Update-FolderPermission
- Update-FrameworkInPackages
- Update-Ownership
- Update-PrinterPermission
- Update-RegistryPermission
- Update-SessionEnvironmentVariables

## Existing or changed functions

- Close-InstallationProgress
- Copy-File
- Disable-TerminalServerInstallMode
- Enable-TerminalServerInstallMode
- Exit-Script
- Get-FileVersion

- Get-FreeDiskSpace
- Get-HardwarePlatform
- Get-IniValue
- Get-InstalledApplication
- Get-LoggedOnUser
- Get-PendingReboot
- Get-RegistryKey
- Get-ServiceStartMode
- Install-MSUpdates
- Install-SCCMSoftwareUpdates
- Invoke-RegisterOrUnregisterDLL
- Invoke-SCCMTask
- New-Folder
- New-MsiTransform
- New-Shortcut
- Remove-File
- Remove-Folder
- Remove-MSIApplications
- Remove-RegistryKey
- Resolve-Error
- Set-ActiveSetup
- Set-IniValue
- Set-PinnedApplication
- Set-RegistryKey
- Set-ServiceStartMode
- Show-BalloonTip
- Show-DialogBox
- Show-InstallationProgress
- Show-InstallationPrompt
- Show-InstallationRestartPrompt
- Show-InstallationWelcome
- Start-MSI
- Start-Program
- Start-ServiceAndDependencies
- Stop-ServiceAndDependencies
- Test-MSUpdates
- Test-Ping
- Test-RegistryKey
- Test-ServiceExists
- Update-Desktop
- Write-FunctionHeaderOrFooter

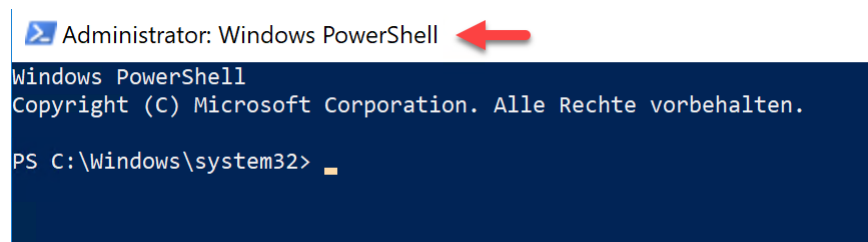
- Write-Log

## Removed functions:

- Execute-ProcessAsUser
- Invoke-HKCURegistrySettingsForAllUsers
- Test-Battery
- Test-NetworkConnection

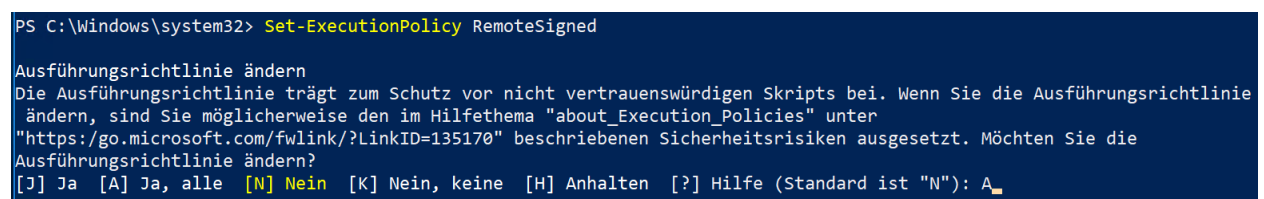
## Getting started guide

First make sure, you start your PowerShell session with local admin permissions. When UAC is enabled, make sure to start your PowerShell session in elevated mode.



Also make sure your PowerShell execution policy is configured to run scripts, i.e. you can configure it with this PowerShell command:


### 1. Set-ExecutionPolicy RemoteSigned (depending on your scenario)



To import the module, use the following PowerShell command:

### 2. Import-Module PackagingFramework

---

 Administrator: Windows PowerShell

```
PS C:\Windows\system32> Import-Module PackagingFramework
PS C:\Windows\system32> █
```





To Initialize the runtime variables, use the following PowerShell command:

### 3. Initialize-Script

```
Administrator: Windows PowerShell
PS C:\Windows\system32> Initialize-Script
[10-20-2017 14:05:13.576] [Initialization] [PackagingFramework] :: *****
*****
[10-20-2017 14:05:13.654] [Initialization] [PackagingFramework] :: Import Extension [C:\Program Files\WindowsPowerShell\
Modules\PackagingFramework\..\PackagingFrameworkExtension\PackagingFrameworkExtension.psd1]
[10-20-2017 14:05:13.669] [Initialization] [PackagingFramework] :: PackagingFramework module version is [1.0.0.0]
[10-20-2017 14:05:13.685] [Initialization] [PackagingFramework] :: PackagingFramework module base [C:\Program Files\Wind
owsPowerShell\Modules\PackagingFramework]
[10-20-2017 14:05:13.685] [Initialization] [PackagingFramework] :: PackagingFrameworkExtension module version is [1.0.0.
0]
[10-20-2017 14:05:13.685] [Initialization] [PackagingFramework] :: PackagingFrameworkExtension module base [C:\Program F
iles\WindowsPowerShell\Modules\PackagingFrameworkExtension]
[10-20-2017 14:05:13.685] [Initialization] [PackagingFramework] :: Computer Name is [DESKTOP-H4187DA]
[10-20-2017 14:05:13.685] [Initialization] [PackagingFramework] :: Current User is [DESKTOP-H4187DA\ceterion]
[10-20-2017 14:05:13.685] [Initialization] [PackagingFramework] :: OS Version is [Microsoft Windows 10 Enterprise Evalua
tion 64-bit 10.0.16299]
[10-20-2017 14:05:13.701] [Initialization] [PackagingFramework] :: OS Type is [Workstation]
[10-20-2017 14:05:13.763] [Initialization] [PackagingFramework] :: Current Culture is [de-DE] and UI language is [DE]
[10-20-2017 14:05:13.841] [Initialization] [PackagingFramework] :: Hardware Platform is [Virtual:Hyper-V]
[10-20-2017 14:05:13.857] [Initialization] [PackagingFramework] :: PowerShell Host is [ConsoleHost] with version [5.1.16
299.15]
[10-20-2017 14:05:13.857] [Initialization] [PackagingFramework] :: PowerShell Version is [5.1.16299.15 x64]
[10-20-2017 14:05:13.857] [Initialization] [PackagingFramework] :: PowerShell CLR (.NET) version is [4.0.30319.42000]
[10-20-2017 14:05:13.857] [Initialization] [PackagingFramework] :: Installation is running in [Install] type.
[10-20-2017 14:05:13.857] [Initialization] [PackagingFramework] :: Initialize-Script completed.
[10-20-2017 14:05:13.873] [Initialization] [PackagingFramework] :: *****
*****
PS C:\Windows\system32>
```

The get a list of all included commands use the following PowerShell command:

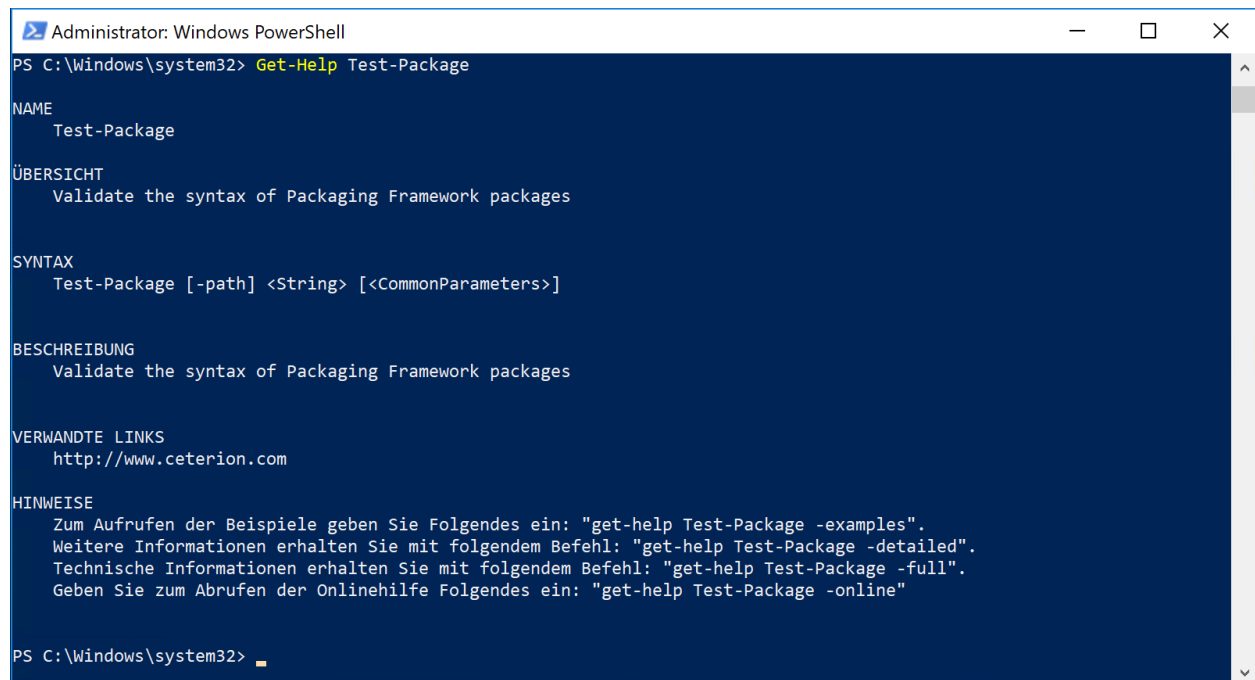
## Get-Command -Module PackagingFramework

```
Administrator: Windows PowerShell
PS C:\Windows\system32> Get-Command -Module PackagingFramework
```

CommandType	Name	Version	Source
Alias	Register-DLL	1.0.0.0	PackagingFramework
Alias	Unregister-DLL	1.0.0.0	PackagingFramework
Function	Add-Font	1.0.0.0	PackagingFramework
Function	Add-Path	1.0.0.0	PackagingFramework
Function	Convert-Base64	1.0.0.0	PackagingFramework
Function	ConvertFrom-AAPINI	1.0.0.0	PackagingFramework
Function	ConvertFrom-Ini	1.0.0.0	PackagingFramework
Function	ConvertFrom-IniFiletoObjectCollection	1.0.0.0	PackagingFramework
Function	ConvertTo-Ini	1.0.0.0	PackagingFramework
Function	ConvertTo-NTAccountOrSID	1.0.0.0	PackagingFramework
Function	Copy-File	1.0.0.0	PackagingFramework
Function	Disable-TerminalServerInstallMode	1.0.0.0	PackagingFramework
Function	Edit-StringInFile	1.0.0.0	PackagingFramework
Function	Enable-TerminalServerInstallMode	1.0.0.0	PackagingFramework
Function	Exit-Script	1.0.0.0	PackagingFramework
Function	Expand-Variable	1.0.0.0	PackagingFramework
Function	Get-EnvironmentVariable	1.0.0.0	PackagingFramework
Function	Get-FileVerb	1.0.0.0	PackagingFramework
Function	Get-FileVersion	1.0.0.0	PackagingFramework
Function	Get-FreeDiskSpace	1.0.0.0	PackagingFramework
Function	Get-HardwarePlatform	1.0.0.0	PackagingFramework
Function	Get-IniValue	1.0.0.0	PackagingFramework
Function	Get-InstalledApplication	1.0.0.0	PackagingFramework
Function	Get-LoggedOnUser	1.0.0.0	PackagingFramework

To get help for the individual PowerShell commands of the module use the following PowerShell command:

Get-Help <Command>



```
Administrator: Windows PowerShell
PS C:\Windows\system32> Get-Help Test-Package

NAME
    Test-Package

ÜBERSICHT
    Validate the syntax of Packaging Framework packages

SYNTAX
    Test-Package [-path] <String> [<CommonParameters>]

BESCHREIBUNG
    Validate the syntax of Packaging Framework packages

VERWANDTE LINKS
    http://www.ceterion.com

HINWEISE
    Zum Aufrufen der Beispiele geben Sie Folgendes ein: "get-help Test-Package -examples".
    Weitere Informationen erhalten Sie mit folgendem Befehl: "get-help Test-Package -detailed".
    Technische Informationen erhalten Sie mit folgendem Befehl: "get-help Test-Package -full".
    Geben Sie zum Abrufen der Onlinehilfe Folgendes ein: "get-help Test-Package -online"

PS C:\Windows\system32>
```

To get a full help of all included command use the following PowerShell command:

[Get-Command -Module PackagingFramework | Get-Help](#)

To get a list of all runtime variables use the following PowerShell command:

[Get-Variable | Out-GridView](#)

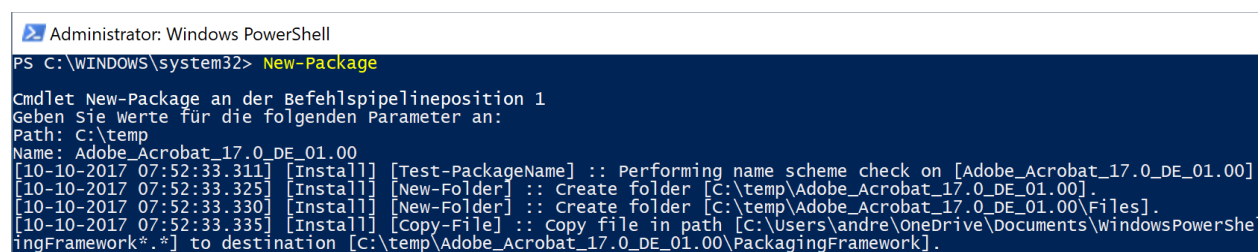
[Get-Variable | Out-GridView](#)

Filter	
+ Kriterien hinzufügen ▼	
Name	Value
CurrentProcessSID	S-1-5-21-1520544230-3956485659-3817253734-1001
CurrentProcessToken	System.Security.Principal.WindowsIdentity
CurrentTime	14:05:10
CurrentTimeZoneBias	02:00:00
CustomTypesFile	C:\Program Files\WindowsPowerShell\Modules\PackagingFrame...
DebugPreference	SilentlyContinue
DefaultUserProfile	C:\Users\Default
Error	{}
ErrorActionPreference	Continue
ErrorView	NormalView
ExampleVarFromExtension	Hello World
ExecutionContext	System.Management.Automation.EngineIntrinsics
false	False
Files	System.Management.Automation.InvocationInfo.MyCommand.D...
FormatEnumerationLimit	4
HOME	C:\Users\ceterion
HomeDrive	C:
HomePath	\Users\ceterion
HomeShare	
Host	System.Management.Automation.Internal.Host.InternalHost

## How to create a package

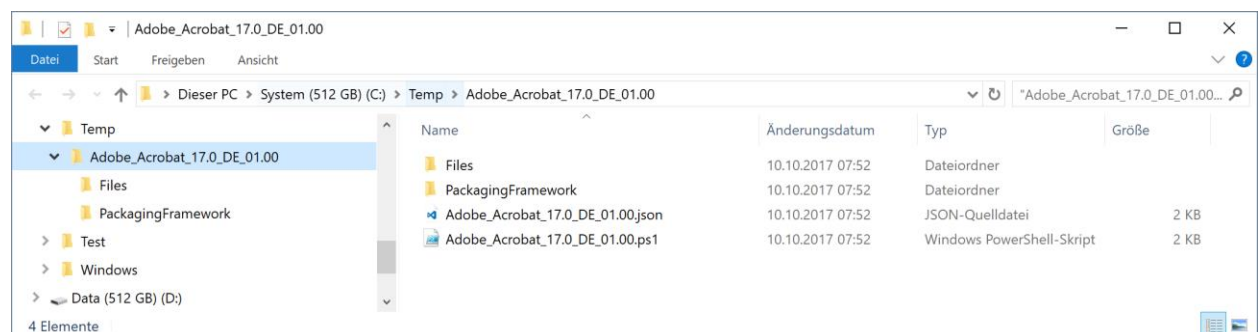
To create your first own package with cmPF, use the following PowerShell command:

`New-Package -Path C:\Temp -Name 'Adobe_Acrobat_17.0_DE_01.00'`  
 (Specify the desired package path and the package name  
 According to the name schema (customizable, in the delivery state  
 from AppVendor, AppName, AppVersion, AppLanguage and package Version)



```
Administrator: Windows PowerShell
PS C:\WINDOWS\system32> New-Package

Cmdlet New-Package an der Befehlspipelineposition 1
Geben Sie Werte für die folgenden Parameter an:
Path: C:\temp
Name: Adobe_Acrobat_17.0_DE_01.00
[10-10-2017 07:52:33.311] [Install] [Test-PackageName] :: Performing name scheme check on [Adobe_Acrobat_17.0_DE_01.00]
[10-10-2017 07:52:33.325] [Install] [New-Folder] :: Create folder [C:\temp\Adobe_Acrobat_17.0_DE_01.00].
[10-10-2017 07:52:33.330] [Install] [New-Folder] :: Create folder [C:\temp\Adobe_Acrobat_17.0_DE_01.00\Files].
[10-10-2017 07:52:33.335] [Install] [Copy-File] :: copy file in path [C:\Users\andre\OneDrive\Documents\WindowsPowerShe
ingFramework*.ps1] to destination [C:\temp\Adobe_Acrobat_17.0_DE_01.00\PackagingFramework].
```



Open your Adobe\_Acrobat\_17.0\_DE\_01.00.ps1-file and edit:

```
[CmdletBinding()] Param ([Parameter(Mandatory=$false)] [ValidateSet('Install','Uninstall')]
[string]$DeploymentType='Install', [Parameter(Mandatory=$false)]
[ValidateSet('Interactive','Silent','NonInteractive')] [string]$DeployMode='Interactive')
Try {
    # Import Packaging Framework Module
    Import-Module PackagingFramework ; Initialize-Script
    # Install
    If ($deploymentType -ieq 'Install') {
        # <PLACE YOUR CODE HERE>
    }
    # Uninstall
    If ($deploymentType -ieq 'Uninstall') {
        # <PLACE YOUR CODE HERE>
    }
    # Call the exit-Script
    Exit-Script -ExitCode $mainExitCode
}
Catch { [int32]$mainExitCode = 60001; [string]$mainErrorMessage = "$(Resolve-Error)"; Write-Log -
Message $mainErrorMessage -Severity 3 -Source $PackagingFrameworkName ; Show-DialogBox -Text
$mainErrorMessage -Icon 'Stop' ; Exit-Script -ExitCode $mainExitCode }
```

```
[CmdletBinding()] Param ([Parameter(Mandatory=$false)] [ValidateSet('Install','Uninstall')]
[string]$DeploymentType='Install', [Parameter(Mandatory=$false)]
[ValidateSet('Interactive','Silent','NonInteractive')] [string]$DeployMode='Interactive')
Try {
    # Import Packaging Framework Module
    Import-Module PackagingFramework ; Initialize-Script
    # Install
    If ($deploymentType -ieq 'Install') {
        Start-MSI -Action 'Install' -Path "$Files\AcroRead.msi" -Parameters "AUTOUPDATE=NO"
    }
    # Uninstall
    If ($deploymentType -ieq 'Uninstall') {
        Start-MSI -Action 'Uninstall' -Path "$Files\AcroRead.msi"
    }
    # Call the exit-Script
    Exit-Script -ExitCode $mainExitCode
}
Catch { [int32]$mainExitCode = 60001; [string]$mainErrorMessage = "$(Resolve-Error)" ; Write-Log -
Message $mainErrorMessage -Severity 3 -Source $PackagingFrameworkName ; Show-DialogBox -Text
$mainErrorMessage -Icon 'Stop' ; Exit-Script -ExitCode $mainExitCode}
```

Copy the Adobe-Installation Files into the folder:  
 "C:\Temp\Adobe\_Acrobat\_17.0\_DE\_01.00\Files"

Edit the Adobe\_Acrobat\_17.0\_DE\_01.00.json with Notepad or Visual Studio Code like this:

```
{
  "Package": {
    "PackageDate": „10.10.2017“,
    "PackageAuthor": „Your Name“,
    "PackageDescription": "Adobe Acrobat Reader 17.0"
  },
  "Applications": [
    {
      "AppName": "Acrobat Reader",
      "AppFolder": "Utilities",
      "AppCommandLineExecutable": "%ProgramFiles%\AcrobatReader\AcrobatReader.exe",
      "AppCommandLineArguments": "",
      "AppWorkingDirectory": "",
      "AppAccounts": []
    }
  ],
  "DetectionMethods": [
  ],
  "Dependencies": [],
  "Parameters": {},
  "Notes": [],
  "ChangeLog": [
    "Version 1.0 initial release"
  ]
}
```

## JSON File

- Each package has its own individual JSON file which gets the same name as the package folder and script
- The JSON file is being read and processed during package execution.
- Start menu links or Citrix published apps are automatically created or prepared using publishing settings from json file
- information such as license keys, Groups, host names, as parameter related and uses
- The JSON file can also be centralized on a network share Centrally placed configuration files override default configurations within packages. This makes it possible, to use the same package for different customers/clients with different configurations

### Sections in JSON Files:

- **Package** includes general metadata about the package such as description, author, date
- **Applications** is always to be filled when Start menu links (on client OS) or published Applications (Server OS/Citrix) have to be created. The creation of the Citrix Publ. Apps takes place further through the CitrixPublishing package (not included by default)
- **DetectionMethods** is for SCCM with the path to a uniquely identifiable file of the package to populate "dependencies". It's optional and contains information about prerequisites in form of a free text
- **Changelog** contains information about what changes have been made to the package in which version.
- **Parameters** is an optional section if the package is to be controlled flexibly by parameters at runtime
- **Notes** is optional and contains information similar to a readme.txt file in form of free text
- **PackageDate** Date of package creation or last modification
- **PackageAuthor** Name of the package creator
- **PackageDescription** Description,
- **PackageInstallName** Display name is used for example in dialogs (optional)
- **PackageInstallTitle** Display title is used for example in dialogs (optional)
- **AppName** Application name, e.g. Google Chrome
- **AppCommandLineExecutable** Path to the program file, e.g. %ProgramFiles%\Google\Chrome\chrome.exe

- **AppWorkingDirectory** working directory.  
e.g. %ProgramFiles%\Google\Chrome
  - **AppFolder** Application Folder for Start menu or Citrix console, e.g. "Google"
  - **AppCommandLineArguments** e.g. [www.ceterion.de](http://www.ceterion.de)
  - **AppIconSource** Icon file (if it does not come from the .exe file,  
e.g. %ProgramFiles%\Google\Chrome\ Chrome.ico)
  - **AppIconIndex** Indexnumber of the icon if there are multiple icons in a  
file, e.g. 5
  - **AppAccounts** User group, also several possible, e.g. Domain\Domain  
users
- 
- A single JSON file can contain several applications in the applications  
section (see e.g. office package like winword.exe, excel.exe,  
powerpoint.exe)
  - There may also be multiple accounts in the accounts section of the  
applications to authorize multiple groups
  - You can also use other Citrix Publ. App properties are specified (see  
Citrix New-BrokerApplication PowerShell command, optional available)
  - The json-file can be used optionally to make packages more flexible,  
e.g. for:
    - Component selection (keyword ADDLOCAL)
    - flexible target directory (keyword INSTDIR)
    - different license keys for different users/customers
    - different Backend systems for different environments (e.g. Dev,  
pilot, prod)
    - switching on and off of Div. installation options or optimization  
parameters
    - can be encrypted if required (e.g. passwords)
    - within the package convenient access to the parameters via get  
parameter
  - Several clients, one package
    - you are able to use one and the same package multiple times for  
different customers/clients, by combining the installation logic (.  
PS1 file) with different JSON files containing specific  
configuration data for each installation
    - by default, the local \$PackageName. JSON that is contained in  
the package is used at runtime of the package.





- Optionally, this \$PackageName.JSON can also be used from different network shares to apply distinct configurations to any user/customer/client
- On the network share, there must be a folder which is named as the package itself. It must contain the JSON file with the file name \$PackageName.JSON
- This folder can optionally be used to store other customer-specific things such as license files, other configuration files or. MST files
- The path to the network share is defined by the registry key HKLM\Software\PackagingFramework\ConfigRepositoryShare
- Optionally, a user account and password (encrypted) can also be specified for access to the network share the package
- Ceterion\_Packagingframeworkconfig\_ 1.0 \_ml\_ 1.00 contains the appropriate logic to set it up on the target system

To customize the packaging framework to your needs please have a look at the module configuration file at:

'%ProgramFiles%\WindowsPowerShell\Modules\PackagingFramework\PackagingFramework.json'

When the "Example Package" option was selected while installing the setup, you will find the examples at:

'%MyDocuments%\Packaging Framework Examples'

It also contains a template (Ceterion\_examplepackage\_ 1.0 \_en\_ 01.00) with instructions for the contained commands and functions.

```
Ceterion_ExamplePackage_1.0_EN_01.00.ps1 X
215 | #region Execute...
243 |
244 | #region MSI...
280 |
281 | #region Files...
305 |
306 | #region Registry
307 |
308 |     # Retrieve a registry value
309 |     $Result = Get-RegistryKey -Key 'HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\I
310 |     if ($Result) {Write-Log "Result= $Result"}
311 |
312 |     # Retrieve multiple values from a registry key
313 |     $Result = Get-RegistryKey -Key 'HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\I
314 |     if ($Result) {
```

You can contact us at the following email address:

[PackagingFramework@ceterion.com](mailto:PackagingFramework@ceterion.com)