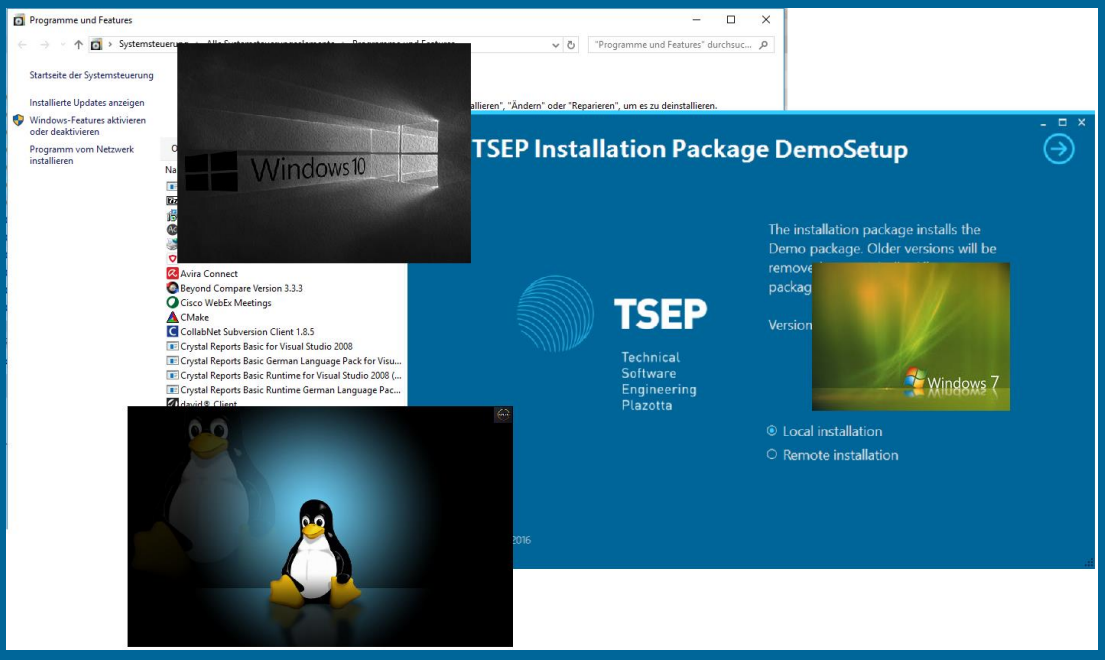
TSEP

TECHNICAL SOFTWARE ENGINEERING PLAZOTTA

Our work is inspired by science, not fiction!

TSEP Kratos
Imaging and Software Installation Toolkit



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Introduction:

TSEP Kratos is an imaging and software installation toolkit. At present, TSEP Kratos supports all Microsoft operating systems as well as Linux derivatives.

With embedded devices it is necessary to modify the operating system specifically to the requirements of the customer. Such devices do not have an open operating system like a normal Windows PC, but define a corresponding work environment for the device software.

Normal software installation systems, designed and developed for end-user computers, cover the requirements of embedded devices only in part. Requirements such as distributed installations or safety aspects are not possible with these installation systems.

TSEP Kratos closes this gap and offers these functionalities. Based on TSEP's long-term experience with embedded devices, TSEP Kratos has been developed and further developed over the past 15 years.

TSEP Kratos can use the most current installation protocols (MSI, APT), or use the proprietary TSEP system to build cross-system installation packages. With TSEP Kratos, installation packages can also be distributed and installed over the network. If necessary, the communication can also be encrypted, which ensures that no malicious software is installed on the embedded device.

TSEP Kratos provides a high level of security for both the operating systems and the software installation, since these two components are one of the safety-critical components in an embedded device. Especially regarding the issues of malware or stability.

TSEP Kratos / Imaging:

In the case of embedded devices, the operating systems are usually preconfigured. This is necessary since certain operating system parameters could directly affect the behaviour of your device. In addition, a certain "corporate identity" is to be reflected by the Embedded Device. An ever more important aspect for the preconfiguration of operating systems is the provision of customer specific security settings. Especially due to the increasing spread of malware, this is an extremely important issue.

In the area of Linux, the question of the components used and their licensing conditions is an eminently important topic. Since the device firmware is generally not an open source software, the compliance with the licensing conditions must be meticulously.

All this shows that an off the rack operating system cannot be used. TSEP has been working on this topic for more than 15 years, producing hundreds of preconfigured operating systems for its customers.

TSEP has developed a system to identify the requirements with its customers and then document them accordingly. This documentation is the basis for creating the preconfigured operating system. TSEP has developed a sophisticated test method to ensure compliance with the requirements. The TSEP Herakles test tool is used to automatically test TSEP-created operating systems. Thus, TSEP can always ensure the operability and configuration of the operating system. All test results are recorded and can be viewed by customers at any time.

TSEP also provides a variety of tools and solutions for the handling of the images. Whether for the production process, to bring the image to the device, in the service to simply restore defective devices or at the customer to be able to correct any misconfiguration or the like.

Software Deployment Tool:

In production, the image and various manufacturing-related settings must be made to the embedded device. In the case of complex devices, this can be more than hundreds of settings. This means actions such as personalization (serial number, computer name, etc.) or configuration (default backup). All these settings can no longer be executed by hand in a production process, the traceability would no longer exist. TSEP has therefore developed the "Software Deployment Tool".

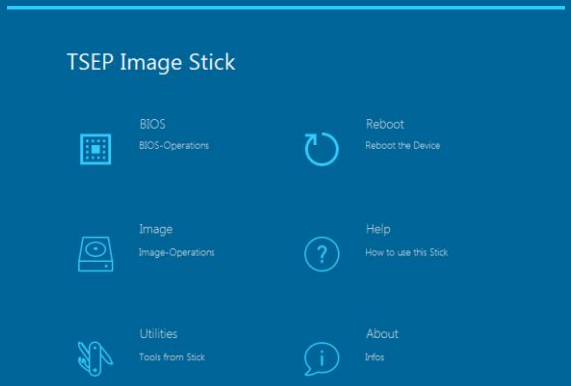
The "Software Deployment Tool" allows you to execute as many individual steps as you like automatically on the device. In this case, a corresponding auxiliary OS is started, which controls the configuration process on the device. The individual steps can be created and maintained by the customer or TSEP.

There are currently 2 different variants of the tool.

The "USB Software Deployment Tool" is used for devices with smaller piece numbers, ie less than 500 devices per year. The entire process is controlled via a USB stick. All necessary data can be found on the USB stick. In production, the USB stick is simply plugged directly into the device and booted by it. The entire process is automated. After the process is finished, the stick can be used on another device. With the help of this tool you can also create a lot more devices, but it should not be forgotten here that a central control of the production with the decentralized USB stick does not exist.

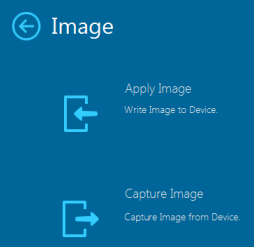
A central client server solution exists for devices with larger numbers. The auxiliary OS is started via the network on the device. All necessary data are centrally managed and loaded as required. The entire manufacturing process can be centrally controlled and managed. Both solutions do not differ from the performance or the functionality provided.

The "Software Deployment Tool" may only be used in connection with the operating system images created by TSEP.

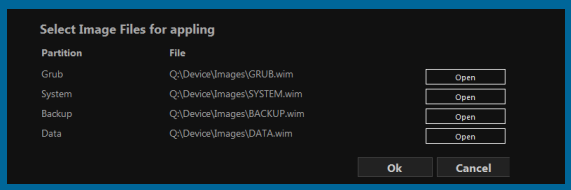


USB Image Stick:

With TSEP Kratos USB Image Stick, the customer can at any time copy his image to the device. All necessary files are copied to a USB stick, which must then be booted on the target device.



The USB Image Stick has been developed in order to be able to easily and quickly transfer an image to the corresponding development device.



In addition, some important additional functions are available. This way, images can also be stored on the stick, or the BIOS can be flashed. Access to a console is also possible.

The tool has been designed for development and therefore avoids security queries and great explanations for the individual functions. The target group for this tool was only developers.

USB Recovery Stick:

The USB Recovery Stick was designed for system recovery at the customer's premises. In contrast to the "USB Image Stick", the user can hardly control the process. This was intended, as in the normal case the customer has no idea what variant of the device or what hardware expansion is present. The USB Recovery Stick independently determines all relevant parameters and can evaluate them. This ensures that the corresponding recovery is performed only on the target device.

As a rule, the USB Recovery Sticks are provided as packaged archives and then unpacked by the end user on a stick with the aid of a user interface. These archives are usually provided to the end user via the Internet.

This type of recovery is of course only sensible if there is no defect in the storage medium. To test for this, the USB Recovery Stick can determine different device parameters (e.g., SMART values) and draw conclusions as to whether a recovery is meaningful at all or a repair is necessary. This algorithm can be used to avoid a multiple result-free recovery in the case of defective data storage.

The USB Recovery Stick user interface can be adapted to customer requirements, so that the customer-specific CI is fulfilled. Device specific images can also be displayed on the main dialog.

TSEP Kratos Windows 10 RE:

In Windows 10, Microsoft offers a recovery and backup solution. However, this cannot be used or can only be used for embedded devices and their preconfigured operating systems. In the original state, WinRE can put the Windows installation into the delivery state, ie without preconfiguration. This must of course be avoided with these devices. Therefore, TSEP has adapted WinRE so that these vulnerabilities no longer exist. In addition, some improvements, like the interplay with the "recovery Stick" and a possibility of a default backup were installed.

With the aid of the default backup, which can be generated during production, the end customer can at any time put his device back into the delivery state.

TSEP Kratos / Software Installation:

The software installation for embedded devices differs basically from an installation on a normal Windows or Linux PC. As a rule, these embedded devices have a specially adapted operating system, possibly no screen for visualization or simply no other software than the software verified by the manufacturer can be installed. Normal installation systems cannot afford these. Therefore, TSEP Kratos / software installation was developed specifically for this use case. The requirements on this software component came directly from customers and were implemented accordingly. The system has been in operation for approx. 15 years and has proven itself in many thousands of installations.

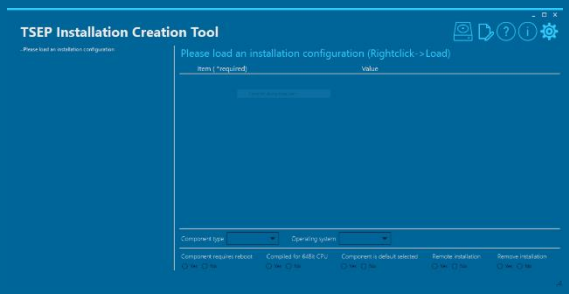
The TSEP Kratos installation system has been further developed over the years to support the new standards, operating system and customer requirements. A major focus was on the downward compatibility, so that old software components can be used further by customers.

The TSEP Kratos installation system consists of several components.

With the help of the "Installation Creation Tool", the user can configure, manage and create his installation. The tool also helps to create a fault-free and optimal setup for the user.

With the help of the software distributor and the software installation service, the software is distributed to the devices. The "Software Installation Service" is installed on the Embedded Devices and enables installation via the network.

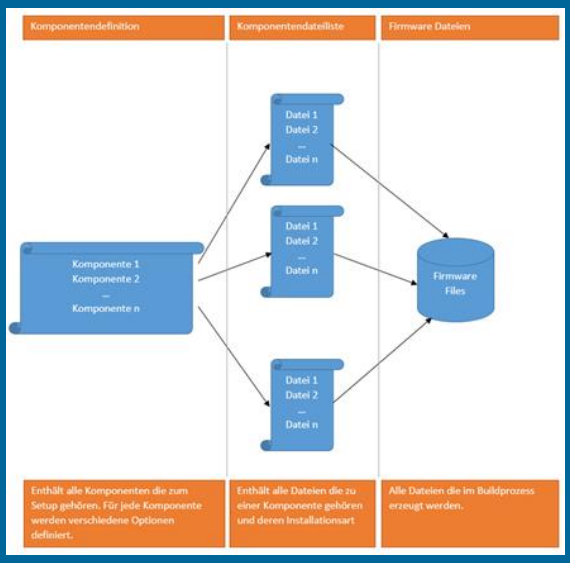
All configuration files are stored in the Windows INI file format so that they can be easily managed by software version control systems. This kind of files can be merged without problems. In addition, the entries are readable and intuitive, so that no problems arise when combining different version strings.



Installation Creation Tool:

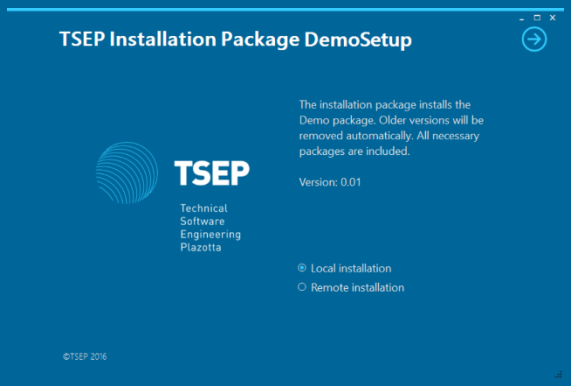
Using the Installation Creation Tool, the files and actions associated with an installation can be combined with a graphical user interface. Here, the user can insert the used files, define their installation location and, if necessary, define and manage corresponding actions (installation of a driver, link to the desktop, creation of a link in the file system, etc.). Each installation can be divided into several components in order to be able to reuse partial recurring parts in other installations. Also, files can only be installed on specific operating systems, which is extremely helpful in supporting multiple operating system generations. It is also possible to define installations for different device variants. Thus, files and actions can only be executed on certain devices.

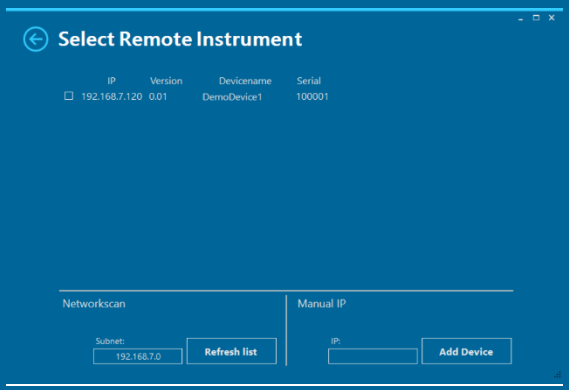
The basic concept of each installation is that each setup is composed of several components and each component is either an external supply from set-up package or executable software.



For large installation packages, TSEP Kratos is used at customers with set-ups up to 1 GB, the Installation Creation Tool supports the user with a large number of checks and monitoring. This way, duplicate files are detected and eliminated, or incorrect path information and missing files are communicated to the user.

The Installation Creation Tool helps the user to compile all the installation files and finally convert them into an executable set-up. In this case, a database is created from the input data (ie configuration files, installation files) from which a setup is created after verifying all installation steps.





Software Distributor:

The individual subcomponents are combined by a so-called "installation chainer", in TSEP Kratos called the "TSEP Software Distributor". This tool contains the user interface that is displayed to the user during setup. In addition, it controls the sequence of the necessary components and delivers the results to the user. The software distributor offers some features which are especially advantageous in the embedded area.

Process without user interaction:

The software distributor can also install software without a user interface. For this, a wide range of command line options are available to the user. This feature is also necessary to install software in automated environments.

Signing of setups:

The software distributor naturally supports signing up the setup to create trustworthy setups. Modern operating systems, such as Windows 10 IoT, can prevent the installation of non-signed or incorrectly signed installation files.

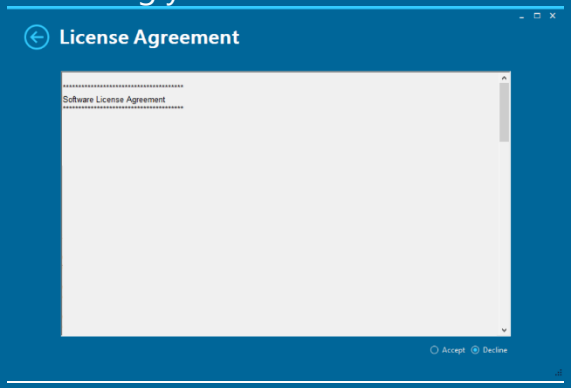
Distribution in the network:

The TSEP Kratos Software Installation Service running on embedded devices can also be used to perform installations over the network. Not only single installations can be carried out, the software distributor supports up to 256 parallel installations. The communication between the software distributor and the software installation service can be encrypted as required. Each customer can select their own coding when encrypting, thus gives the customer maximum security during installation. In addition, the remote installation can also be visualized to the end customer. TSEP has defined an interface that can either be implemented in the customer software or accessed via the TSEP Kratos Remote Installation Viewer. This can also be used to display the installation process for remote installations to the end customer.

Uninstallation routines:

The software distributor also ensures that an installation can be carried out at any time. For this the previous version is removed, on software versions the software distributor waives,

and according to the specifications the device is cleansed and checked accordingly.

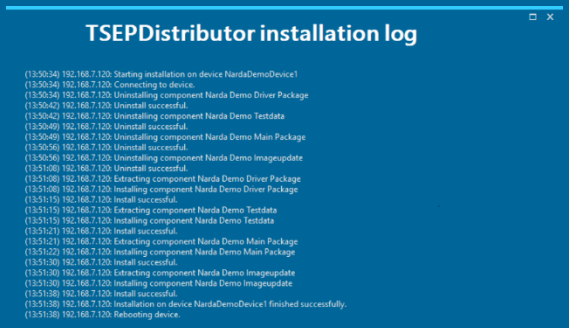


License agreements:

The software distributor can also request explicit license agreements from customers before the software can be installed. This ensures that there are no license violations

Verification of installation:

The software distributor can also check the installed files at the end of the installation with the help of hash values, thus ensuring that the installed files are really present on the data carriers. This measure has already proven itself many times in the case of customers, since especially cheap USB sticks have led to installation problems. This can be checked with this system at the end of the installation and communicated to the user.



Logging the installation:

The entire installation process is logged and can be viewed at any time. If problems occur during installation, this error analysis protocol is used.

Multilingual installations:

Of course, multi-lingual set-ups can be created using the "Installation Creation Tool" and the software distributor. For German and English the corresponding templates are available, all other languages can be created on customer request.

Prices:

All prices are in Euro and excl. VAT. In the following, one unit price per device type has to be paid for each device.

Imaging:

TSEP Kratos Customized Image	Price on effort	
TSEP Kratos „Software Deployment“	Price on effort	
TSEP Kratos „Image Stick“ (only for images created by TSEP)	free	
TSEP Kratos „Recovery Stick“	per device	1999,-- €
TSEP Kratos „W10 RE“ (Only for images created by TSEP)	free	

Software Installation:

TSEP Kratos „Software Installation“	per Device	3999,-- €
TSEP Kratos Option „Remote Installation“	per Device	999,-- €
TSEP Kratos Option „Multi-Device Installation“	per Device	1999,-- €

Support:

TSEP Kratos Support (Telephone and email support)	per Year	2400,-- €

Full Licence Packet:

TSEP Kratos without any limitations	On request