Information

PROFINET

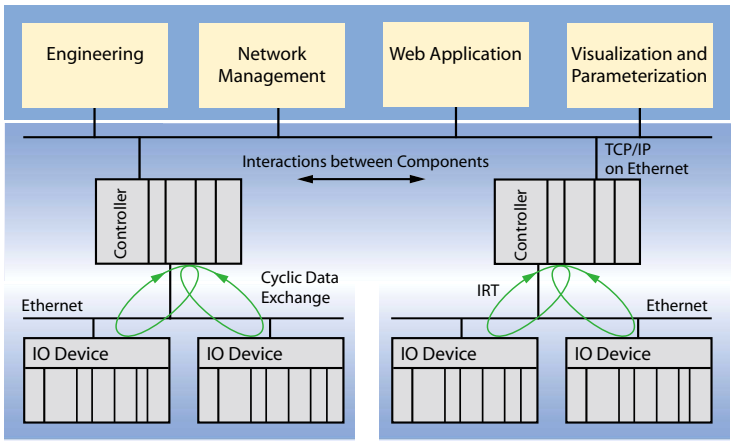
Industrial Automation

Training, Services and Products

softing

PROFINET Technology

PROFINET is the Ethernet-based automation standard of PROFIBUS International. Several specifications exist, which describe different system aspects. They will be briefly outlined below.



Modules of PROFINET

PROFINET IO

PROFINET IO is used for data exchange between I/O controllers (PLC, etc.) and I/O devices (field devices). PROFINET IO uses the proven communication model and application view of PROFIBUS DP and extends it by Ethernet as the communication medium. Among other benefits, this provides a greater bandwidth and allows more stations on the network. The PROFINET IO specifications define a protocol and an application interface for exchanging I/O data, alarms and diagnostics and for transmitting data records and logbook information.
To exchange I/O data and alarms, PROFINET IO is based directly on the Ethernet protocol. This real-time (RT) solution allows response times in the range of 5 ms, which corresponds to today's PROFIBUS DP applications. If it has to be even faster and if data exchange should be performed isochronously (IRT), a special chip is used, which also supports switch functions. "Normal" Ethernet communication is of course also possible when using the chip. The solution consists in reserving bandwidth for the isochronous data exchange and bandwidth for "the remainder." Innovations have also been made with regard to the device description in that XML is used for structuring the information.
For all that is new, however, the existing has not been forgotten or dispensed with. The integration of existing fieldbus devices will be performed via proxies, and PROFIBUS profiles will also be available for PROFINET IO. PROFIdrive and PROFIsafe will be the first to be revised.

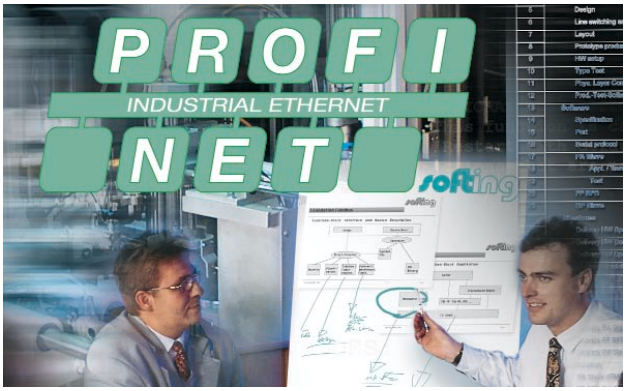
PROFINET CBA (Component based Automation)

Besides the PROFINET IO view of data, PROFINET also supports a component view. In this view, the application software and the devices are modeled as self-contained components which interact via a component bus. TCP/IP or Ethernet is used as the transport protocol. The response times range around 100 ms (non-deterministic) or 5 - 10 ms (deterministic, RT solution). Components are available at system runtime and are used for engineering. This approach allows modularizing the automation solution according to the technological modules (mechanics, electrics. hydraulics, etc.). The automation functionality is available wherever needed. Extensions are easy to implement using pre-established, pretested modules. With PROFINET CBA Engineering, connections between automation components are no longer programmed, but "linked" by logical code. CBA Runtime and CBA Engineering are defined in two specifications. PROFINET IO and PROFINET CBA devices of course can be used together in one application and both protocol variants can be implemented in the same device.

Further Specifications

The PROFINET WebIntegration Specification defines the possibilities of using web technologies for access to PROFINET data. A prototypical implementation will be presented on the next page. The PROFINET Network Management Specification describes how standards from the area of network management are applied to the PROFINET environment. The use of IT protocols also requires considering the corresponding security aspects. The PROFINET Security Specification will define a framework for assessing the risk potential and the appropriate solutions.

Further information on Softing's PROFINET activities is available at: www.profinetsolutions.com



PROFINET Training

As an accredited PROFINET Competence Center, Softing supports you in introducing the PROFINET technology. The training courses we offer are intended for the manufacturers of PROFINET devices and software. The technological basics and the specifications will be explained. There will be ample room for the participants to gain hands-on experience.

PROFINET Workshop

This 1-day workshop focuses on PROFINET IO. Some of the contents are:

- Overview of PROFINET
- Technological basics
- Explanation of the PROFINET IO Specification with practical demonstration
- Device description – The path from GSD to GSDML with practical demonstration
- Bus diagnostics with hands-on exercise
- Time calculations
- Cabling

PROFINET Seminar

This 2-day training comprises the workshop contents, continuing on the second day with PROFINET CBA and the relevant aspects of the other PROFINET Specifications. Some of the contents are:

- Meaning of PROFINET CBA
- Technological basics
- Explanation of the PROFINET CBA Specifications
- Creation of components as a practical example
- PROFINET WebIntegration
- PROFINET Network Management
- PROFINET Security

The latest dates and locations are available at our web site: www.softing.com

If you require deviating training contents, please contact us. We can also hold the training courses at your company and adapt them to your needs.

PROFINET Services

Do you want to expand your product portfolio by PROFINET solutions? We will be happy to assist you.

Feasibility Study

If you consider PROFINET relevant to your products and require detailed, in-depth consultation for crafting the optimum solution, then we are the best place to go. We have a profound know-how of the requirements of automation technology and have a detailed knowledge of PROFINET. A feasibility study should start with a requirements analysis. We examine all aspects such as functionality, demands on the resources and time behavior. In the next step, we draw up scenarios for implementing PROFINET in your system environment. The created conception can be used as the basis for a specification at a later stage of the project.

Stack Porting and Software Development

The PROFINET specifications define communication protocols that are implemented as stacks. We can look back on many years of experience in developing and porting stacks to various target platforms. The stack interface to the application will be customized to your needs.
Engineering and diagnostic tools are required to optimally implement the communication in the application. We offer products that we can flexibly integrate into existing environments.

Hardware Development

All PROFINET protocols are Ethernet-based. If your target hardware already has an Ethernet connection with sufficient performance, the stack can be easily integrated. If an Ethernet interface does not exist yet, or if the existing performance is not sufficient, we will assist you in developing an appropriate hardware platform.

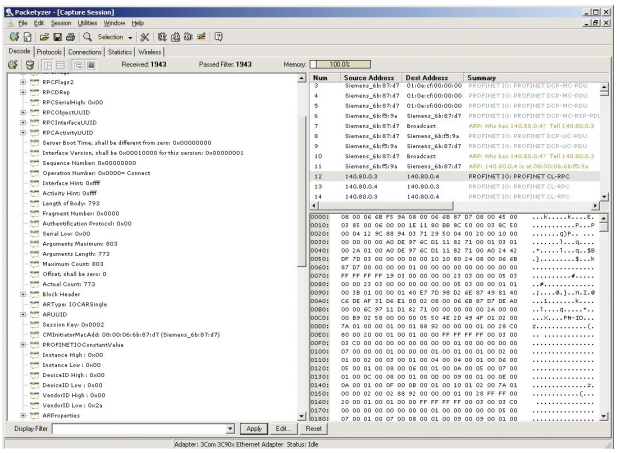
Design-In of Products

Softing provides a range of PROFINET products, which will be further expanded in future. These products have been designed as standalone solutions intended to satisfy the requirements of a broad market. If you come to the conclusion that your product portfolio should include such a product, but that you would like an integration instead of having to develop it yourself, please feel free to contact us. The modular hardware and software structure of our solutions enables us to meet a wide variety of requirements.

PROFINET Products

PROFINET IO Monitoring

The development of PROFINET devices and, above all, the setup and maintenance of PROFINET networks prerequisite the use of suitable analysis tools. While developing a device, tests need to be run to verify whether telegrams are transmitted to the correct station in the correct order, whether the telegram contents correspond to the specified encoding, and much more. In the setup and commissioning stage-and later during plant operation-the focus of diagnostics is turned to examining component interaction. The major importance is now placed on verifying the correct execution of the application logic, which includes the acknowledgment of alarms, the transmission of user diagnostics and the checking of the sequence of execution steps.
The PROFINET IO protocol is Ethernet-based. With Ethereal, a tool is available that is excellently suited for the diagnostics of protocols that use Ethernet as the network. A decoder developed by Softing for the PROFINET IO protocol, configurable filters and a quick reference guide allow the use of Ethereal also for the

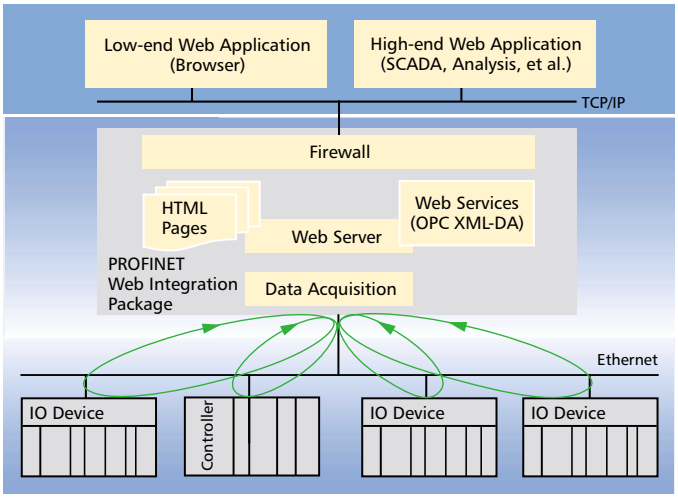


Decoding a PROFINET IO telegram

development, commissioning and diagnostics of PROFINET devices and systems. Users can set filters for various telegram types, contents and data and thus flexibly reduce the amount of information to those they are actually interested in.

The solution can run on Windows PCs with Ethernet connection. No additional hardware is required. Since Ethereal is portable, other hardware and operating-system platforms can be conceivably used.
The corresponding further developments are firmly scheduled for when the PROFINET chips for supporting an isochronous data exchange (ERTECxxx) are available and profiles are used.

PROFINET CBA WebIntegration



Structure of a WebIntegration solution

By combining PROFINET WebIntegration with standard security mechanisms, the PROFINET WebIntegration Package from Softing provides secure access to process, device and plant information on the PROFINET from various visualization, diagnostic, monitoring and asset management applications that can be run at any desired location.
The data is acquired using the PROFINET CBA protocol. Applications can access the information via HTML pages or OPC XML DA. The PROFINET WebIntegration Package implements the definitions of different PROFINET Specifications and allows both, simple browser-based solutions as well as the integration of powerful visualizations. Featuring a firewall and a scaled security concept, data access security can be customized to the specific requirements. The use of a field-proven hardware platform and Linux as the operating system allow the implementation of highly cost-effective solutions.

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