



USB Device Server

Accessing USB Devices via the Network

The USB (Universal Serial Bus) is a simple connection standard used to attach a great number of diverse peripheral devices to PCs and notebooks. Until recently, technical reasons allowed only the connection of USB devices locally or via USB switch. As the recommended maximum length for USB cables is only five meters this left a short range around the computer to use the devices. Users benefit from more flexibility and mobility because they can access their USB devices via a network connection. USB device servers allow them to utilize a great number of simple as well as complex USB devices which are used in many different industries and environments as well as in SOHO and entertainment environments.

This whitepaper discusses the technical background and describes solutions and possible fields of application.

MARGARETE KEULEN

Marketing Communications Manager

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1. PERIPHERAL DEVICES VIA USB

The USB (Universal Serial Bus) connection standard allows the attachment of many different peripherals to PCs and notebooks. Not only keyboards and mice are used in this way. For example, the popularity of disk drives is growing rapidly. These can be utilized to save and archive data and for regular back-ups. Modern multimedia devices such as PDAs, cell phones, and MP3 players, are connected to workstations via a USB interface for an easy and practical data transfer or data synchronization. Meanwhile there exists a great number of USB devices which can be attached to a computer, ranging from laboratory devices and gauges to printers, scanners, and multi-functional peripherals as well as to telephone systems.

Until recently, technical reasons allowed only the connection of USB devices locally or via a USB switch. USB is a master/slave bus which requires a USB host controller. Traditionally, this host controller is installed in a PC or notebook. The USB peripheral can only be operated when the computer to which it is attached is in operation, too. As a rule such locally connected devices can be accessed by one user only. The utilization of such devices is further restricted by the recommended maximum length for USB cables – five meters – for connecting the peripheral to the PC or USB switch.

2. ACCESSING USB DEVICES VIA THE NETWORK

If users access USB devices via a network connection they can use them much more flexibly and mobile, too, as there are no location-based restrictions. Users benefit from three major advantages:

- ▶ **Virtual USB Cable Extension:** myUTN works like a virtual USB cable extension via the network and enables users to utilize USB devices without spatial restrictions.
- ▶ **Availability of a USB Device for Several Users:** As myUTN can be configured that several users can access the same USB device via the network it is not necessary to buy one for each user. In this way USB investment returns can be easily maximized.
- ▶ **Secure and Exclusive Access to USB Devices:** If a user does not want to share his USB device with others but wants to use it exclusively and protected from unauthorized access while remaining spatially flexible and mobile, he can use a USB device server. A secure point-to-point connection ensures that only a designated user can access a certain USB device, just as if it were locally connected.

3. MYUTN USB DEVICE SERVER: MODE OF OPERATION

Based on many years of experience in the development of network solutions SEH has developed a USB device server product line. Two models were launched in 2008: myUTN-50 for the operation of USB devices in Ethernet and Fast Ethernet networks and myUTN-52 for fiber optic networks.

The myUTN models are "plug&play": They can simply be attached to the network, no special drivers are required. The connected peripherals can then be transparently managed, just as if they were locally connected.

Thanks to the SEH UTN Manager that is installed on the PCs, the devices are quickly and easily installed. They can be configured so that only one user can access them like a local peripheral, e.g. with AutoConnect for automatic connection to the PC upon booting.

It is also possible to allow several users to access the same USB device. If a user no longer needs to access this device, he will have to release it so the next person can access it. In this way several users can utilize one device, it is not necessary to buy one for each user. Operating USB device servers can reduce hardware costs for USB devices. Users configure and manage myUTN-50 and myUTN-52 via the browser-based myUTN Web Control Center.

4. MYUTN SECURITY FEATURES

A myUTN USB device server creates a virtual USB cable between a USB device and the computer from which it is accessed. This is protected from unauthorized third parties, just like a physical cable. The result is a secure point-to-point connection via the network which is an advantage over the network connection of USB devices via an NAS server which can be accessed by multiple users.

In addition to this the USB device servers myUTN-50 and myUTN-52 are equipped with further strong security features. The most important of these are:

Darüber hinaus sind die USB Device Server myUTN-50 und myUTN-52 mit weiteren

- ▶ Access control to myUTN-50 and myUTN-52
- ▶ IP Sender-function to define authorized users
- ▶ Password protection for the configuration
- ▶ Port Access Control
- ▶ Configuration encryption (SSL 3.0, TLS 1.0, HTTPS)
- ▶ SNMPv3
- ▶ Certificate management: self-signed certificate, certificate request, root certificate, PKCS#12 certificate
- ▶ Support of several authentication methods according to IEEE 802.1X: EAP-MD5, EAP-TLS, Cisco EAP (LEAP), EAP-FAST, EAP-TTLS, PEAP

5. MYUTN: FIELDS OF APPLICATION

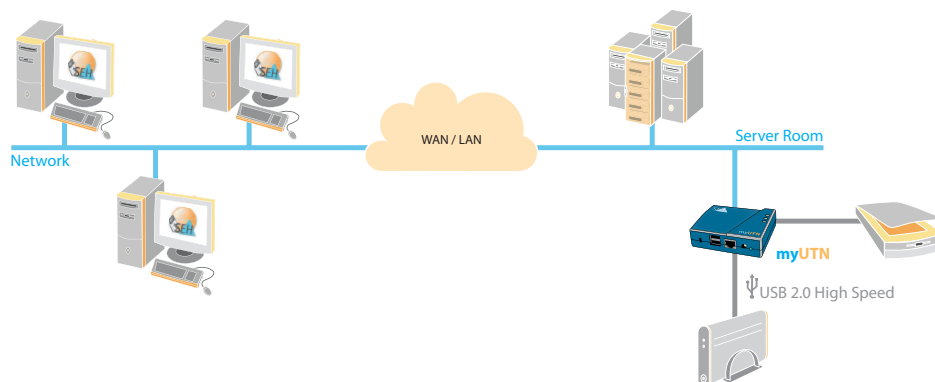
The compact USB device servers myUTN-50 and myUTN-52 enable users to access many simple as well as complex USB devices used in many different industries and environments via the network. For example disk drives, card readers, medical devices, bar code scanners, printers and MFPs, scanners, PDAs and many more. And SOHO and entertainment devices such as MP3 players, TV set-up-boxes etc. There is practically no limit to the imagination when it comes to utilizing USB device servers. Some examples are:

- ▶ External disk drives: Data back-up and theft prevention
- ▶ Telephone systems and CTI applications
- ▶ USB laboratory devices with memory chip
- ▶ Mobile gauges: Administrating data via the network
- ▶ SOHO- and entertainment applications
- ▶ Satellite TV via PVR and set-top boxes

5.1 EXTERNAL DISK DRIVES: DATA BACK-UP

External disk drives are becoming increasingly popular. They are used for saving and archiving digital data as well as for data back-ups and storage. If an external disk drive is locally attached to a PC or notebook via USB only the person using this PC can access it. If this person leaves the workstation the disk drive will be unattended. Even a short absence is enough for unauthorized third parties to access or take away the disk drive. Also, it would be annoying if a USB device were accidentally disconnected – e.g. during the cleaning up around the workstation – and this went unnoticed. In such a case data would not be automatically saved.

IT

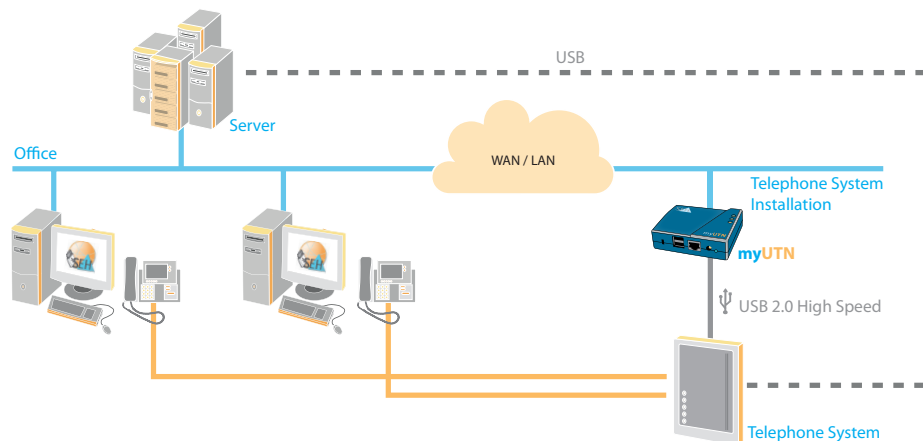


An external disk drive attached to the network via a myUTN device server can be securely mounted in the server room. There still is a safe point-to-point connection between a user and his or her disk drive via the network. In contrast to utilizing an NAS server which can be accessed by multiple users via the network, nobody but the designated user of the disk drive can access it. This is especially important when highly confidential and very sensitive data are concerned (e.g. attorneys, financial sector, government agencies, intelligence and military organizations etc.). In such environments the security features of the myUTN device servers provide added value (encryption, access control, password protection, port access control etc.).

5.2 TELEPHONE SYSTEMS AND CTI APPLICATIONS

CTI (Computer Telephony Integration) applications provide the connection between telecommunication and electronic data processing (e.g. address data banks). Utilizing CTI it is possible to dial-up, accept, and forward telephone calls. Users can establish telephone conference connections, send and receive faxes etc. For example customer data sets can be called up from a data bank to the monitor. If such a solution is installed for several workstations, a special server provides for the connection between the network and the telephone system to take control over the telephone. This server is usually set up in the server room.

Telecommunication

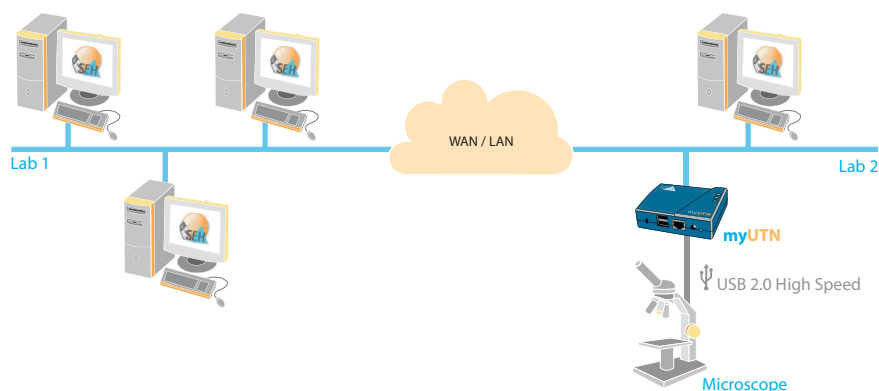


In practice it is quite common to install the telephone system via USB at a considerable distance from the server in the server room – not only farther away than five meters, but often across one or more floors. A USB device server allows the simple attachment of the telephone system to the network so that the distance is quickly and easily bridged. Dialling per mouse click is really easy this way.

5.3 USB-LABORATORY DEVICES WITH MEMORY CHIP

USB devices are also used in medical, pharmaceutical, and other scientific laboratories, such as microscopes with memory chips for saving photographs and data. The analysis and further utilization of these data usually takes place at various PC workstations outside of the laboratory.

Medical Laboratory

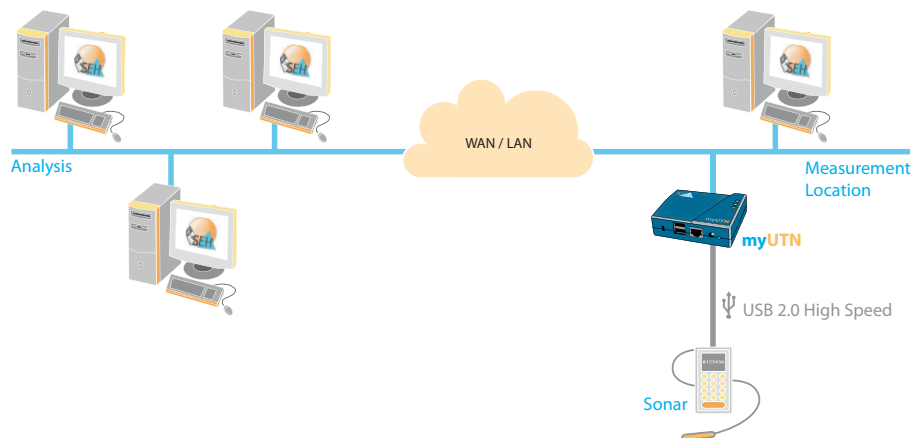


To access such data on a microscope or similar laboratory device from several PCs in a network is a really comfortable solution. In such a scenario a myUTN USB device server bridges the distance and enables the mobile and flexible utilization of such devices.

5.4 MOBILE GAUGES: ADMINISTRATING DATA VIA THE NETWORK

Various USB gauges are used in different environments, e.g. sonars, gauges for air pressure and temperature, layer thickness and much more. Many of these provide data which is best used and administrated in the network.

Industrial Environment



This is another scenario where a myUTN USB device server comes in handy to overcome the five meter restriction of USB cables. In addition there are many more benefits by saving time and making work easier.

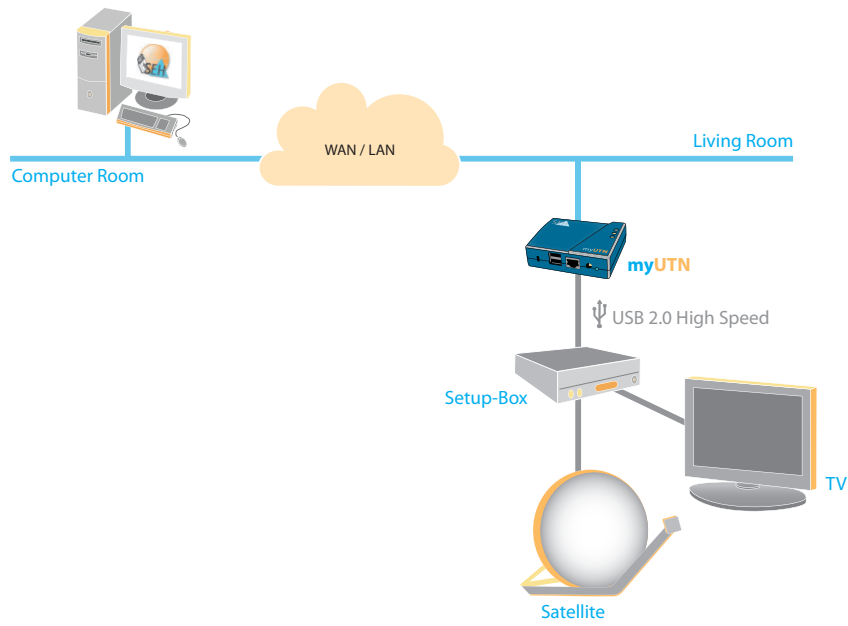
5.5 SOHO AND ENTERTAINMENT APPLICATIONS

Users of SOHO and entertainment applications are also restricted by the typical USB cable length and the local connection of devices such as MP3 players, printers, scanners, MFPs, external disk drives, cameras etc. Instead of carrying such devices from one PC to another or installing a file server just to centrally store their data, users can simply access them in a network via a myUTN device server and make them available for other users in the network, too.

5.6 SATELLITE TV VIA PVR AND SET-TOP BOXES

A set-top box is required to receive and decode digital data for the TV set via satellite. Its integrated web browser and the utilization of TCP/IP turns a TV set without a built-in digital tuner into a user interface to the Internet. High-end set-top boxes are often operated with a Personal Video Recorder (PVR). This device is equipped with a hard disk and often also with a DVD recorder for saving and archiving broadcasts. This enables delayed TV, i.e. users watch one program while recording another simultaneously.

Entertainment



USB connection to a PC allows users an even more effective way to archive and edit recorded broadcasts and configure the device at the PC. However, a five meter USB cable is usually too short to connect the set-top box to the PC. Utilizing a myUTN USB device server to connect the set-top box to the network, users can access it directly and comfortably without any spatial restrictions.

6. MYUTN: REQUIREMENTS FOR OPERATION

Currently, the myUTN product line consists of two models:

- ▶ myUTN-50: For Ethernet/Fast Ethernet (10BaseT/100BaseTX to RJ45)
- ▶ myUTN-52: For fiber optic networks (100BaseFX to SC)

Both USB device servers are equipped with two USB high speed ports (USB 2.0 High Speed), one of which is extendable to four with a separate hub. All in all, up to five USB devices can be attached to the network. Both models are compatible for Windows networks (Vista, XP), Windows Server 2003).

7. INTERNET

For more information about the myUTN USB device servers myUTN-50 and myUTN-52 please refer to our websites www.myUTN.net and www.seh.de.

Disclaimer:

At the time of this paper myUTN USB device servers by SEH do not support USB devices using isochronous data transfer over USB, such as web cameras or speakers. Some USB devices may not be supported depending on the USB device driver specifications. Please visit our websites www.seh.de and www.myUTN.net for the latest information and updates.