VŠB TECHNICKÁ UNIVERZITA OSTRAVA | FAKULTA ELEKTROTECHNIKY A INFORMATIKY | KATEDRA INFORMATIKY

Basics of Information Technology

Ing. Michal Radecký, Ph.D. MBA

Basic information and infrastructure of VSB-TUO

University Structure

1. **University**
   - Statutory level
   - Provision of operational services – catering, accommodation, **infrastructure, technology**, etc.

2. **Faculty (FEI)**
   - Main organizational unit from the point of view of "classification"
   - Providing of the study agenda (faculty level)

3. **Department (Department of Informatics)**
   - The main organizational unit from the point of view of the "study" of a specific study programme
   - Providing of study and agenda at the department

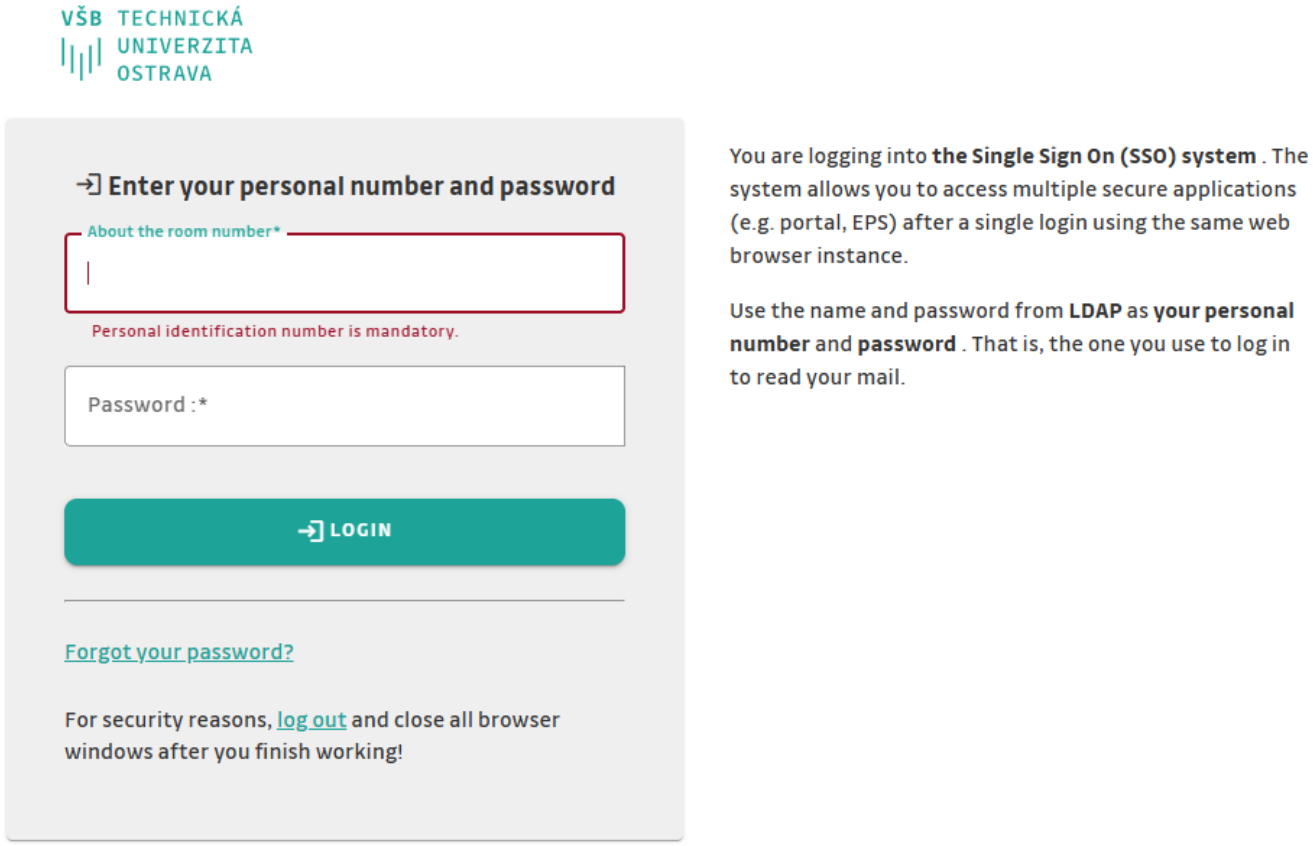
Single sign-on - SSO

SSO (Single Sign-On) is a **sign-in method** that allows a user to log on to multiple services and applications in a single way, without having to re-enter credentials. It uses the principle of creating and sharing a "token" between applications.

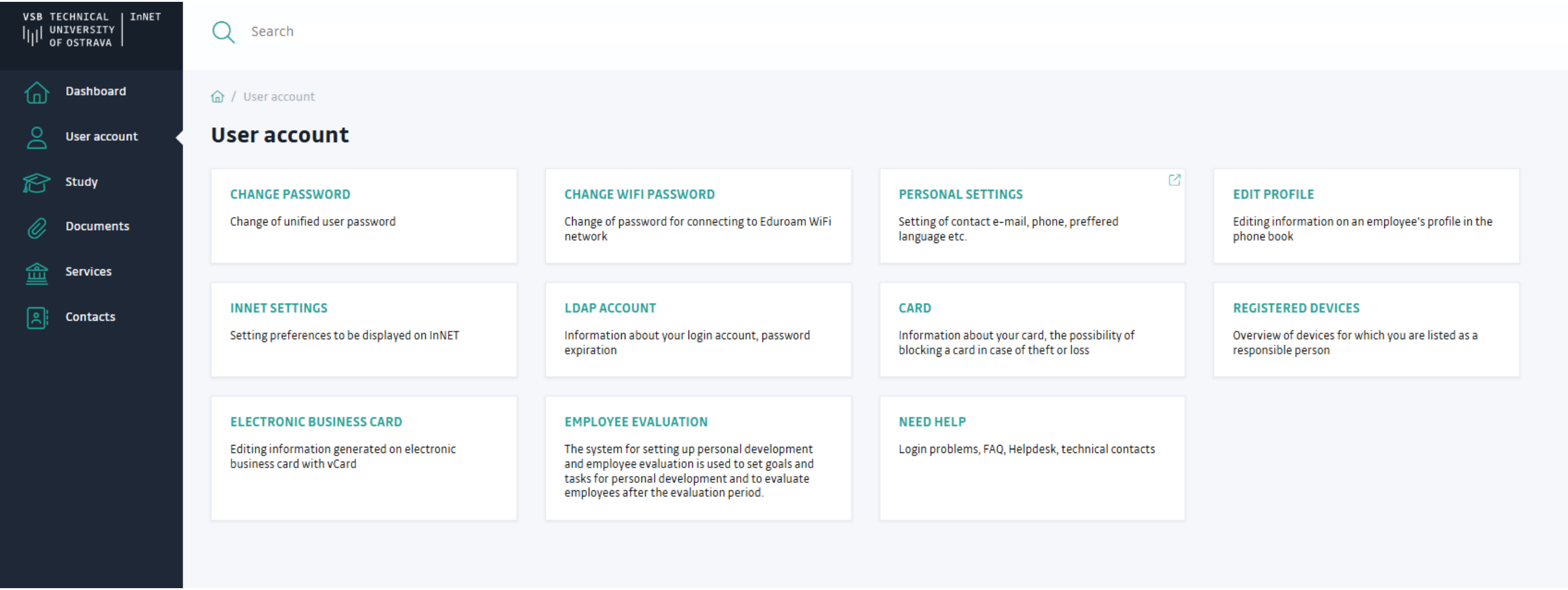
Username: login/personal number [@vsb.cz]

- Only one password (identity)
- Flexible approach
- Garance of the identity
- Higher security (MFA, less password entry)
- Easy to manage

- **MFA** (Multi-Factor Authentication)
  know something, have something, are something
- **Identity Provider**
  - bank identity, OAuth, SAML, OpenID, …
- **LDAP** (Lightweight Directory Access Protocol)
  - identity storage / information of users



https://uzivatel.vsb.cz



https://innet.vsb.cz

Main guidepost for Internal Information and Services

- News & Updates
- Documents, directives, formal information
- IDOC – documentation and instructions
- IDESK/HELPDESK – direct support, infrastructure requirements, etc.
- POŠTA – access to the e-mail web interface
- STRAVOVÁNÍ (canteen)
- LMS, E-LEARNING
- EDISON, SCHEDULE
- PHONE BOOK
- atd.

Electronic mail

https://idoc.vsb.cz/xwiki/bin/view/uzivatel/email/

Email address: **firstname.lastname.st@vsb.cz** (or similar), **login@vsb.cz**

Classic mail server

- Web interface(Roundcube) – posta.vsb.cz
- POP3/IMAP/SMTP
- It is the student's responsibility to monitor their mailbox – the ability to set up redirection (uzivatel.vsb.cz)

MS Exchange/Office365

- Mailbox move request only
- Complex environment based on cloud technology

SMTP
- protocol for sending mail
- may/may not require authentication
- secure variant

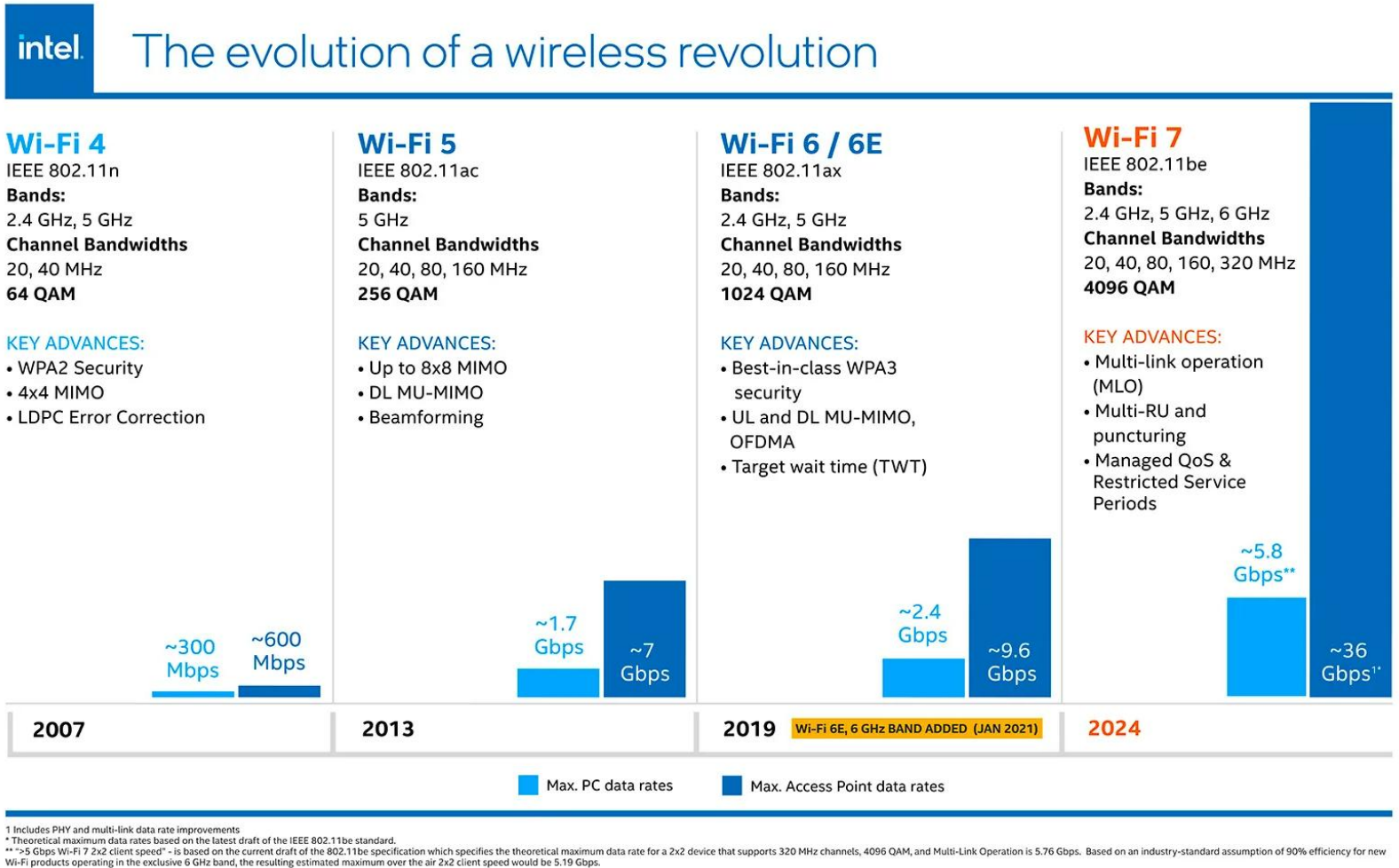
POP3
- protokol for mailbox access
- downloads mail to a local client
- secure variant

IMAP
- protokol for remote access to the mailbox
- mail stays in the mailbox on the server sync folders, read, etc.
- secure variant

Wi-Fi

Technology for **wireless connection to a computer network** (subsequently the Internet). It uses radio waves at frequencies of 2.4 GHz, 5 GHz and 6 GHz.

Various versions (since 1999, 11 Mbps) defining the technologies, speed, security, etc.



Wi-Fi

https://idoc.vsb.cz/xwiki/bin/view/tuonet/wifi/

EDUROAM (Education Roaming)

An international network service that allows students, academics, and staff of universities and research institutions to securely connect to Wi-Fi at **their home school as well as when visiting partner institutions** around the world.

- Logging in to the "eduroam" network with your university credentials (login@vsb.cz, **WifiPass**)
- Authenticate via identity at your home university
- Need for a properly configured profile (automatic configurator, manual)

TUONET-Simple, TUONET-IoT, …

Additional university Wi-Fi networks with a specific operating model.

- TUONET-Simple – no authentication and encryption mechanisms, login via a web browser (every 20 minutes)
- TUONET-IoT – specific Wi-Fi network for Internet of Things devices, limited connection parameters, the need to request for each device

VPN

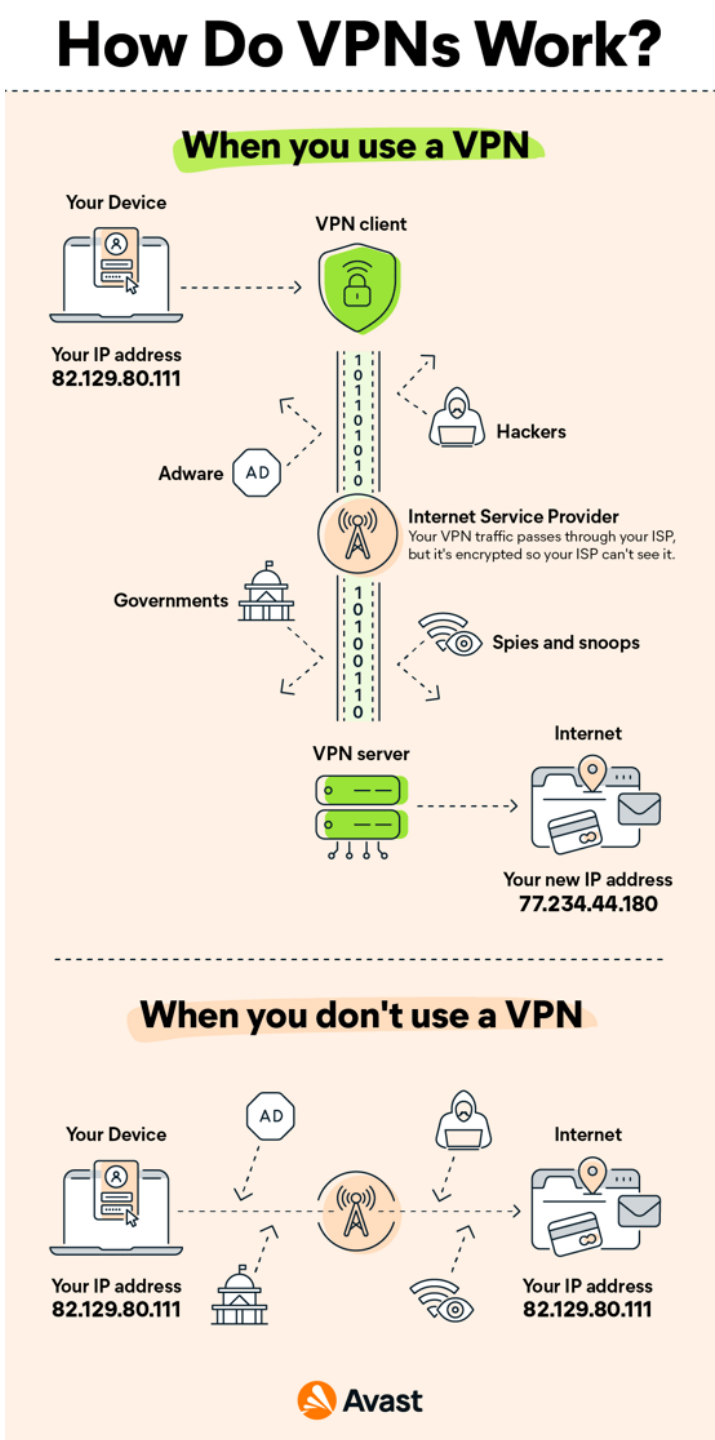
Virtual Private Network is an application or service that encrypts the connection between an end device and the Internet and routes data sent and received through the Secure VPN tunnel.

VPN offers:

- Encrypt all data that is passed between endpoints
- Hide/Change IP Address
- Bypass censorship and tracking
- Allow access to blocked websites and services
- Allow access to geo-blocked content
- Affect positioning services on devices
- Ensures security on public Wi-Fi networks

Familiar services: NordVPN, ExpressVPN, Surfshark, Norton VPN

It requires a client application or is integrated into the operating system.



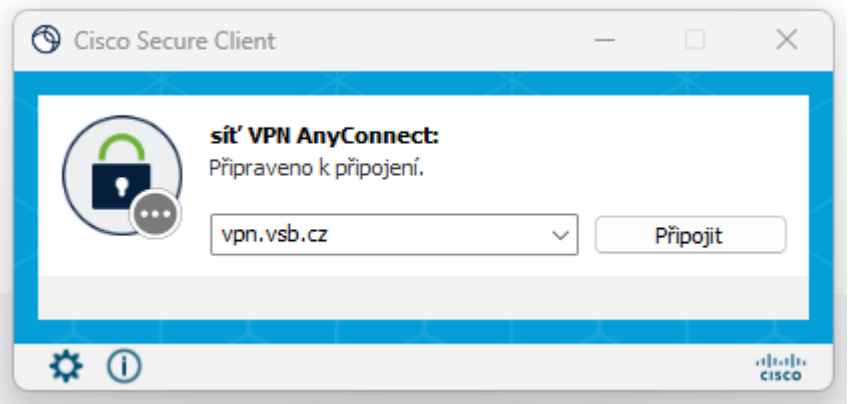
VPN

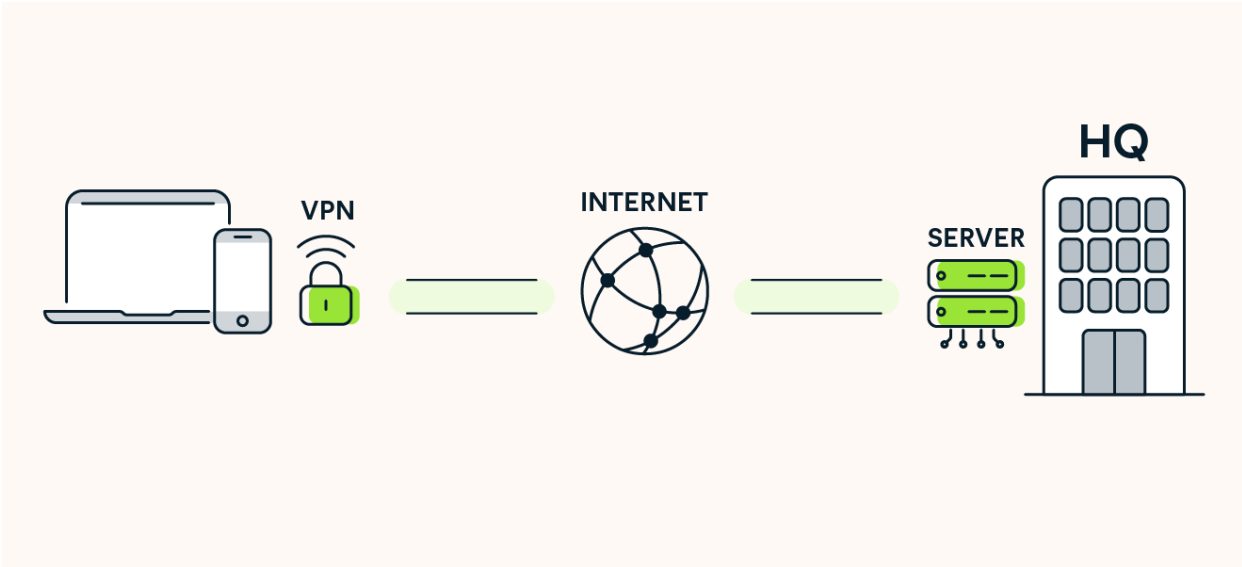
https://idoc.vsb.cz/xwiki/bin/view/tuonet/vpn/

Remote access VPN usage. The connected device becomes part of the infrastructure to which it connects via the Internet.

The computer becomes part of the university network, including the change of the IP address (158.196.x.x) regardless of the provider, place of Internet connection, etc.

Requires installation and configuration of the **Cisco Secure Client** (vpn.vsb.cz). Login with login and LDAP password.





Microsoft 365

https://idoc.vsb.cz/xwiki/bin/view/uzivatel/email/office365-mail/

The ability to use Microsoft 365 cloud services, including Office desktop applications. **The license is granted strictly for the duration of the study.**

You can sign in to the Microsoft 365 cloud (administration, installation) at https://m365.cloud.microsoft/apps (login@vsb.cz and LDAP password)

To use e-mail within M365 (Exchange), you must request a transfer via idesk.vsb.cz.

MS Teams

- A comprehensive tool for communication, data access, sharing, etc.
- Web (https://teams.microsoft.com) or desktop/mobileapp (login@vsb.cz and LDAP password)
- https://idoc.vsb.cz/xwiki/bin/view/uzivatel/prace-v-it-v-prostredi-mimo-univerzitu/ms-teams/

Google Workspace

https://idoc.vsb.cz/xwiki/bin/view/uzivatel/cloud/google-apps/

The ability to use Google Workspace Education cloud services - **strictly for the duration of your studies**.

You can sign in to Google Workspace services using standard Google Account methods.

A Google account is automatically set up, where the login name is a **school email address with the @g.vsb.cz domain**, the password is specific (**does not match LDAP**).

You can find the login and initial password in the uzivatel.vsb.cz (LDAP account).

Microsoft Azure

As a student, you have the option to activate a student Azure account (for learning purposes).

Registration and login at **portal.azure.com** (login@vsb.cz and LDAP password)

- Requires MFA (Multi-Factor Authentication) activation
- Requires status verification for Azure for Students

What it enables and offers

- Access to Microsoft SW (Windows 11 EDU, Visual Studio, etc.)
- Possibility to use FREE services within Azure
- Credit ($89 for 1 year) for the use of paid services
- Access to learning materials and other resources

Other university services and servers

Other services and servers are available within the university/faculty/department infrastructure. In addition, within specific courses, you will have access to other specific services and servers (DB, SAP, IBM, etc.)

- **homel.vsb.cz**
  Web server for custom pages and storage of public data (homel.vsb.cz/~abc123)
  https://idoc.vsb.cz/xwiki/bin/view/servery/homel/
- **gitlab.vsb.cz**
  university-wide web tool for project management (GIT repositories)
  https://idoc.vsb.cz/xwiki/bin/view/servery/gitlab

- **kelvin.cs.vsb.cz**
  Tools for submitting assignments and tests within various subjects

Others outside university services

In relation to the university (affiliation to the university), there are a number of opportunities to obtain specific/advantageous access to various services.

The benefit is based on identity verification within the university (MS Azure), using ISIC, identification by IP address or **through SSO**.

- **Overleaf**
  web tool for creating documents in Latex
  https://knihovna.vsb.cz/cs/podpora-sv/uzitecne-nastroje/overleaf/
- **Citace PRO**
  Tools to support citation of publications
  https://knihovna.vsb.cz/cs/podpora-sv/uzitecne-nastroje/citace/

Linux not only for UPR

The operating system is the basic software that controls the operation of the computer.

Its main tasks are: hardware management, file management, process management, user interface, communication between programs and hardware

Examples of operating systems: Windows, macOS, **Linux**, Android, iOS.

What is Linux?

- Operating system based on the Linux kernel (kernel + GNU) (1991)
- There are variants of the so-called distribution: Debian, Ubuntu, Fedora, Raspberry Pi OS, etc.
- Open source – access to source codes and open-source community
- Package architecture
- Flexibility, adaptability, safety, performance, price, etc.

https://www.youtube.com/watch?v=rrB13utjYV4

Linux not only for UPR

https://mrlvsb.github.io/upr-skripta/prostredi/os/os.html

How to install and use Linux

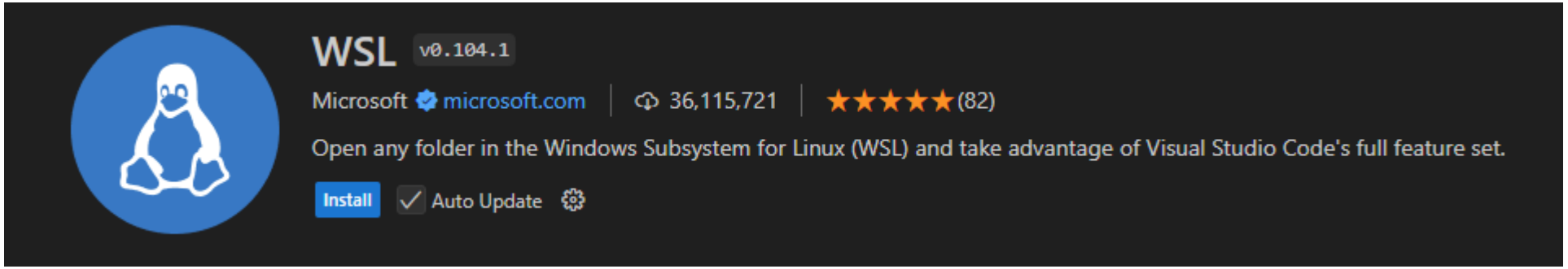
- As a standalone operating system – installation from "image" directly to hardware (multiboot) or "live image", macOS is technically built on similar foundations and principles
- Virtual machine – running inside the host system, so-called virtualization – e.g. VirtualBox
- Container – running inside the host container, so-called containerization – e.g. Docker
- **WSL (Windows Subsystem for Linux v.2)**
  - Ability to run Linux (Ubuntu) directly as part of Windows (program), without virtualization
  - Primarily for terminal level operation (but GUI is also possible)
  - Data/file sharing between Windows and Linux
  - Installation: *wsl (wsl --install)* on the command line (as administrator)
  - Start: app Ubuntu nebo *wsl* (it also allows you to manage distributions, etc.)

  - To install packages for UPR: *$ sudo apt update*, *$ sudo apt install build-essential gdb*
  - To install a file manager: *$ sudo apt install mc*

Linux not only for UPR

Visual Studio Code

- Multiplatform, free and widely used IDE (Integrated Development Environment)
- https://code.visualstudio.com/
- It supports various languages, development environments, workflows, extensions, etc.
- Efficient possibility of connecting VSCode (Windows application) with WSL environment (access to files and tools)



Linux not only for UPR