

Multiagentové systémy

RNDr. Andrej Lúčný

andy@microstep-mis.com

<http://www.microstep-mis.sk/~andy>

Implementácia MAS

Spravidla sa opierame o nejaký existujúci sw.

- Middleware
- IPC
- VM s vláknami

CORBA, RMI

SOAP

TCP/IP (TCP, HTTP)

LAN-WAN

Sieťové
programovanie

JVM

VM

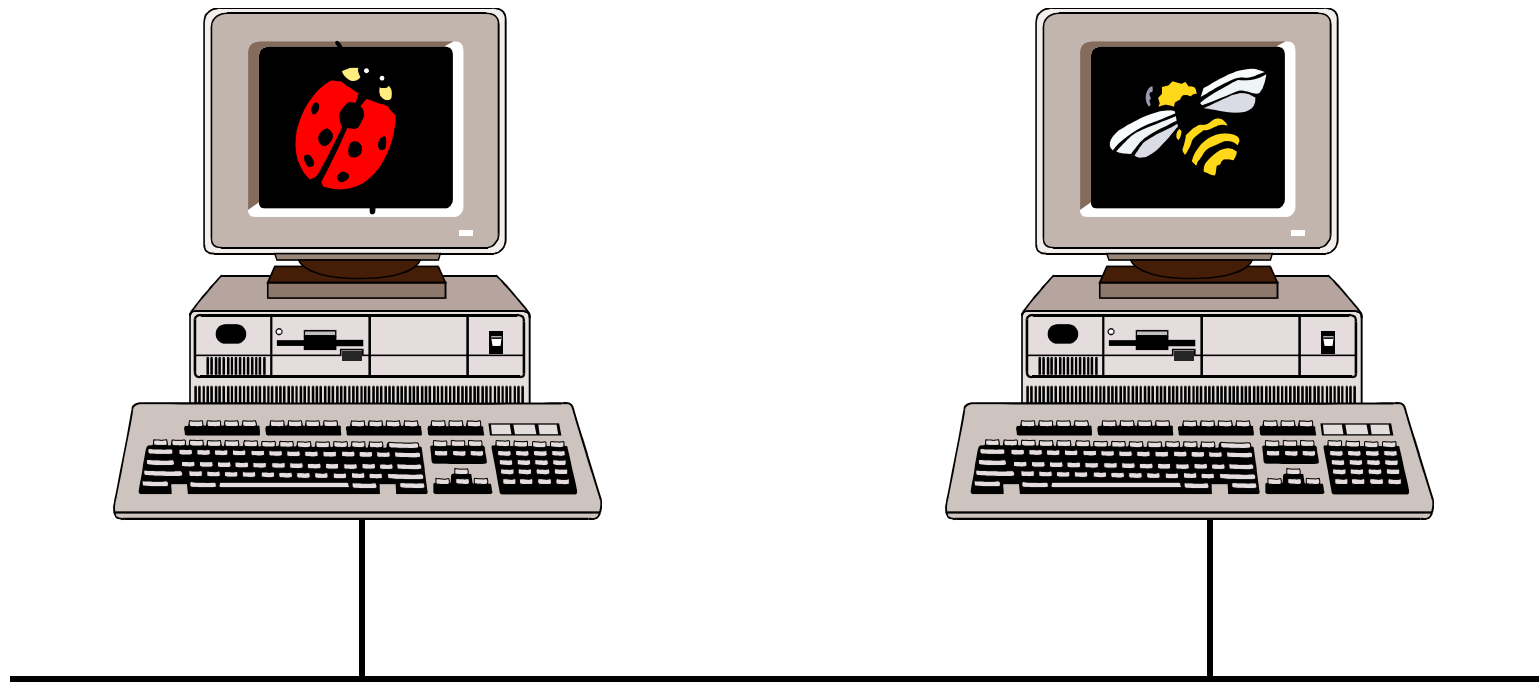
Objektovo
orientované
programovanie

SRR

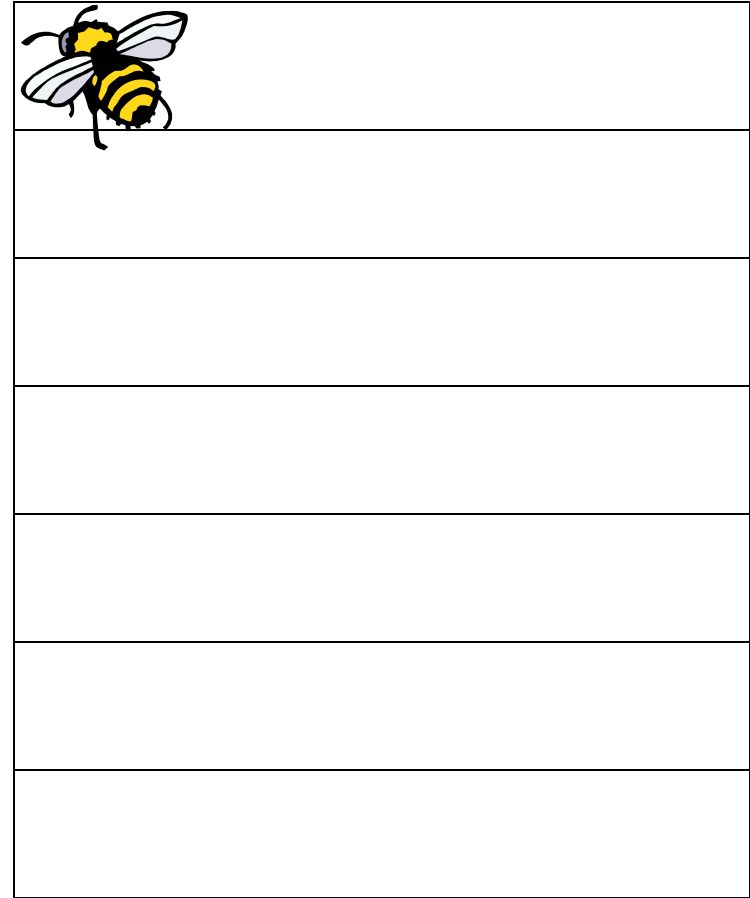
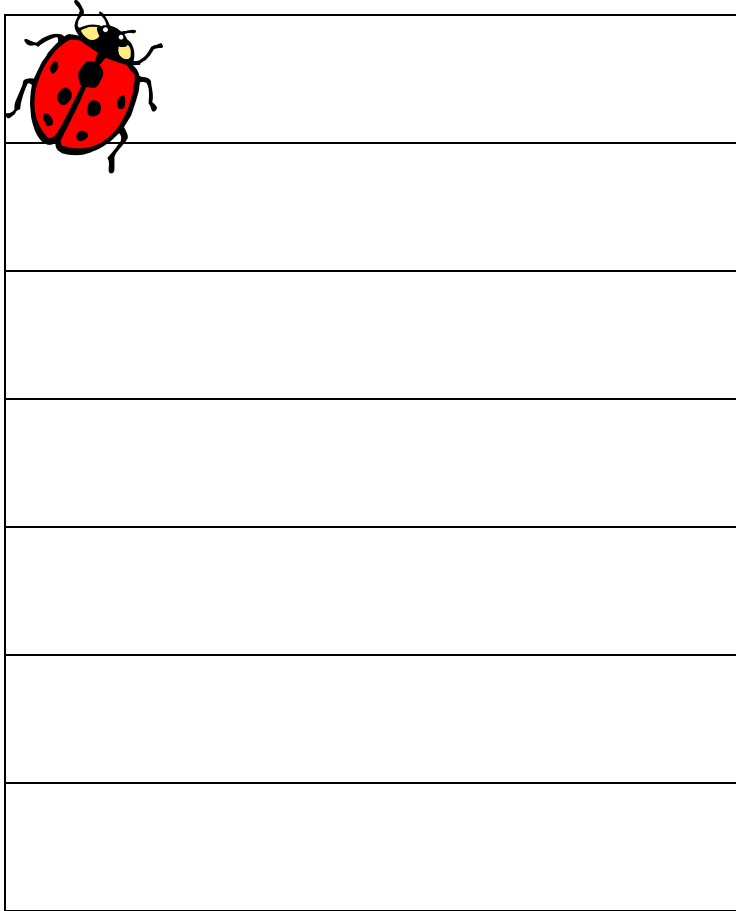
IPC

„concurrent“
programovanie

MAS ako middleware

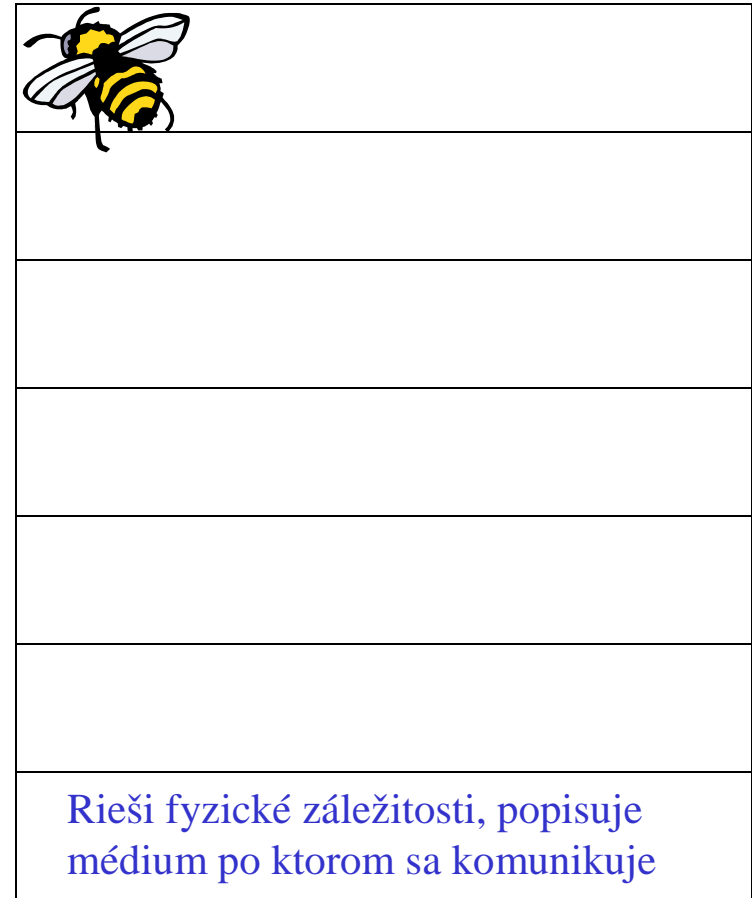
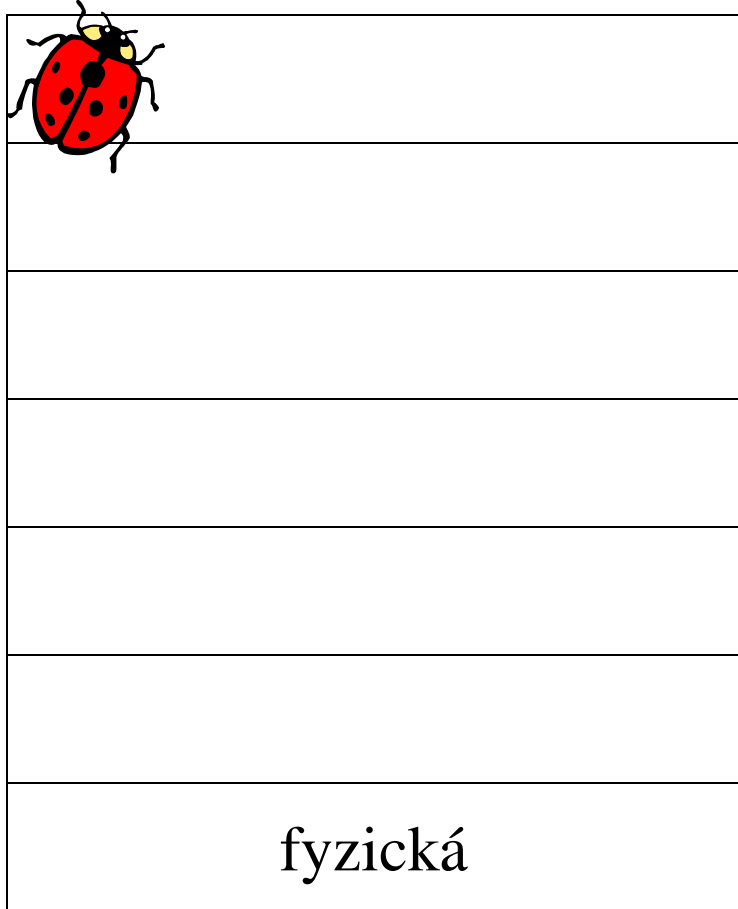


LAN/WAN



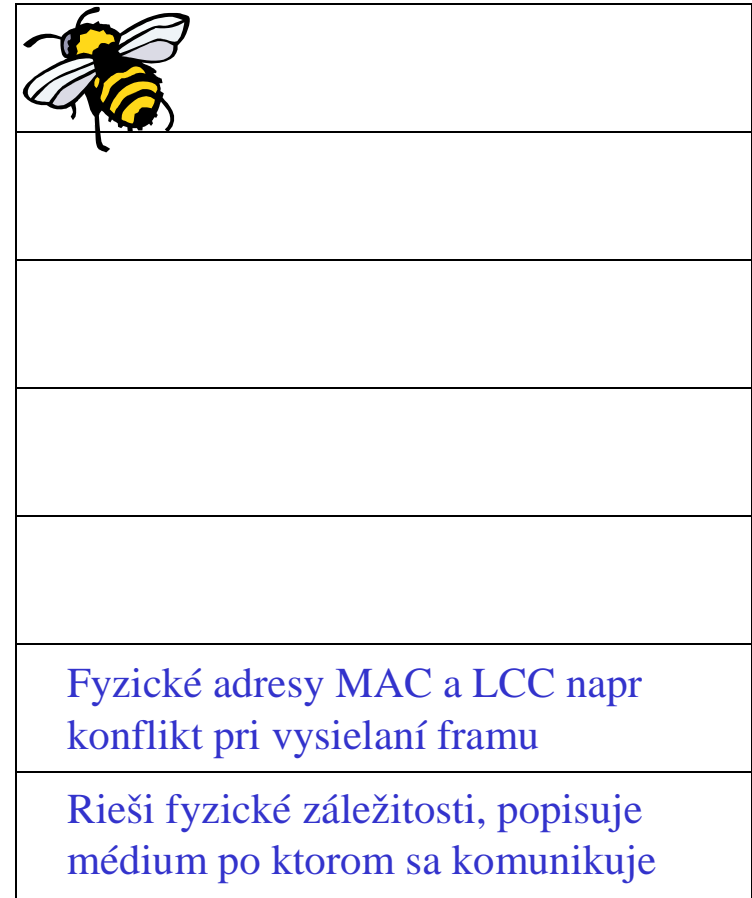
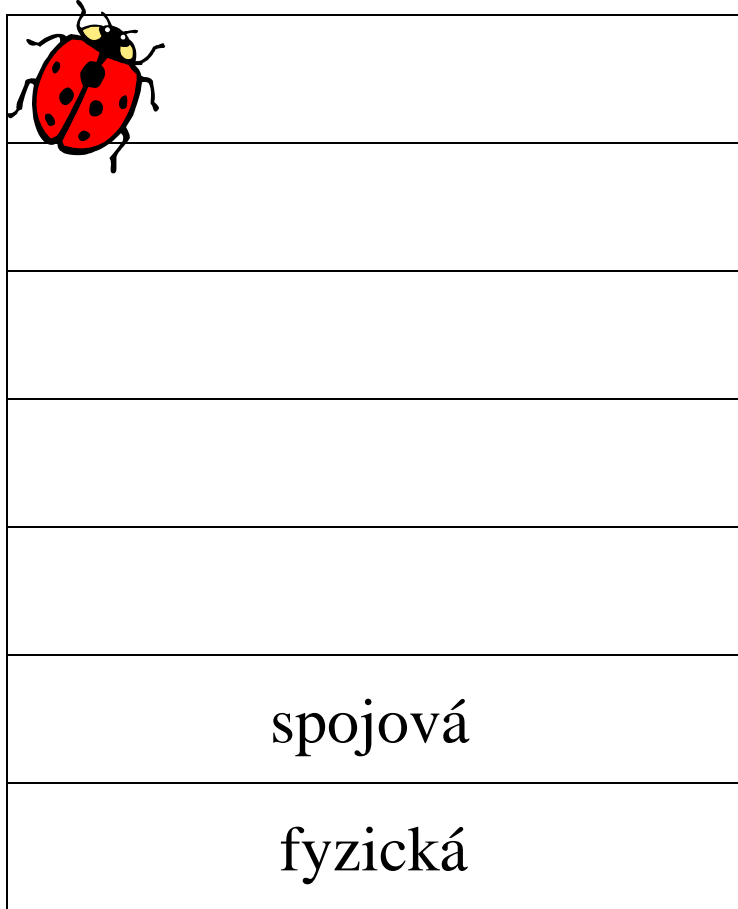
OSI model

LAN/WAN



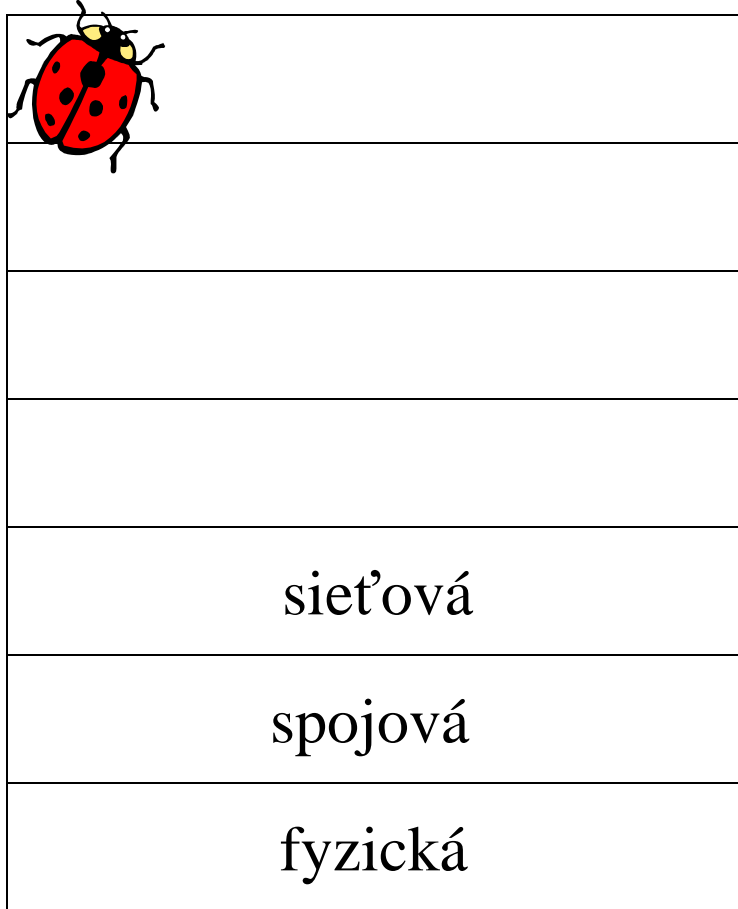
OSI model

LAN/WAN



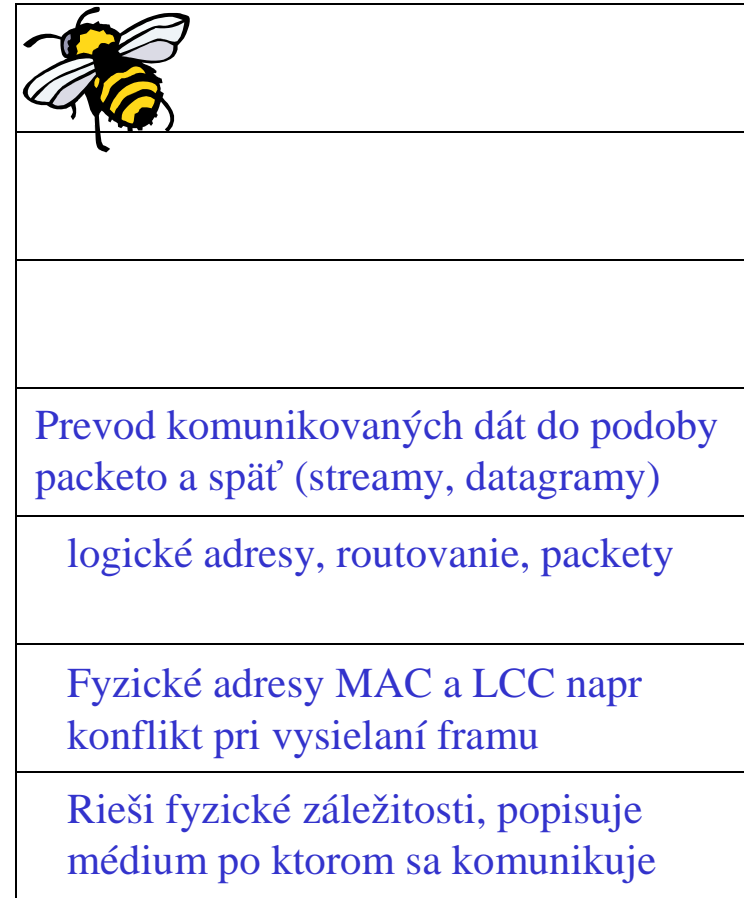
OSI model

LAN/WAN



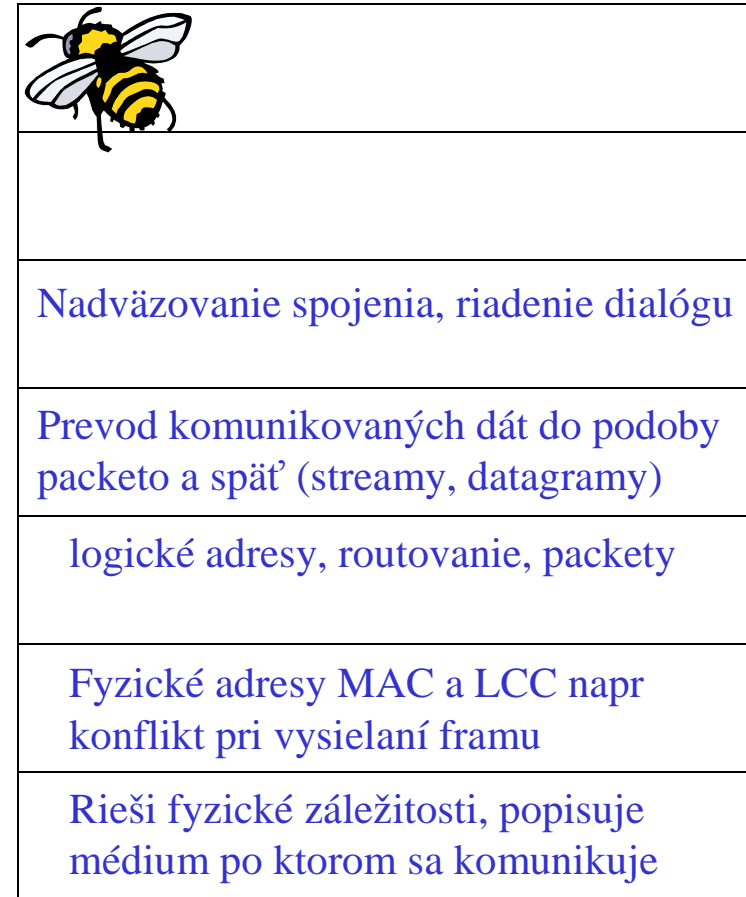
OSI model

LAN/WAN



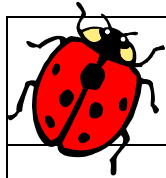
OSI model

LAN/WAN



OSI model

LAN/WAN



prezentačná

relačná

transportná

sieťová

spojová

fyzická



Dohoda na tvare komunikovaných dát

Nadväzovanie spojenia, riadenie dialógu

Prevod komunikovaných dát do podoby
packeto a späť (streamy, datagramy)

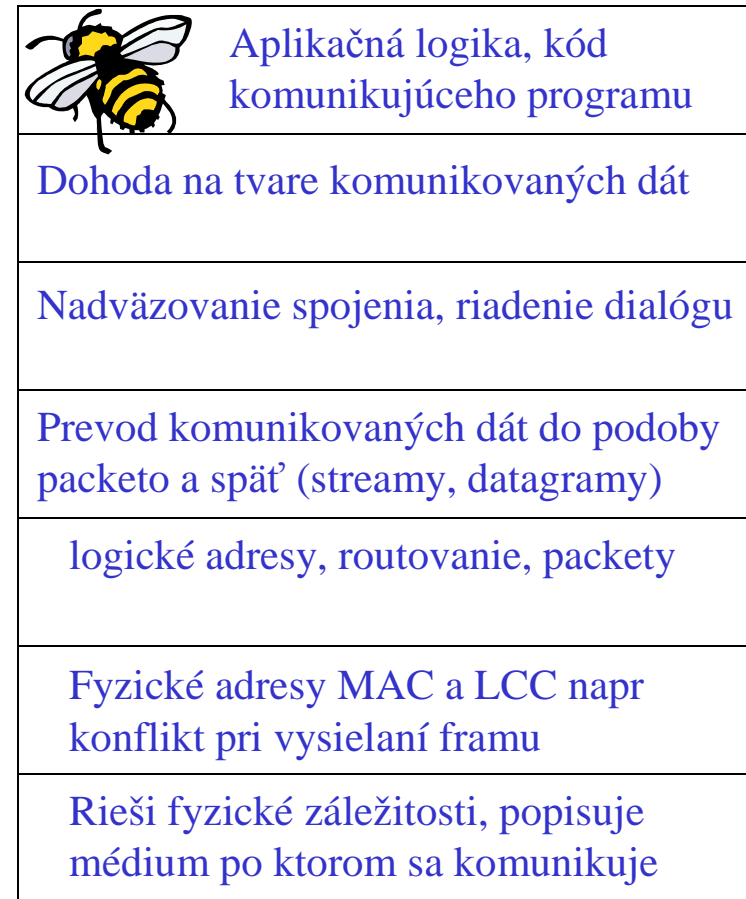
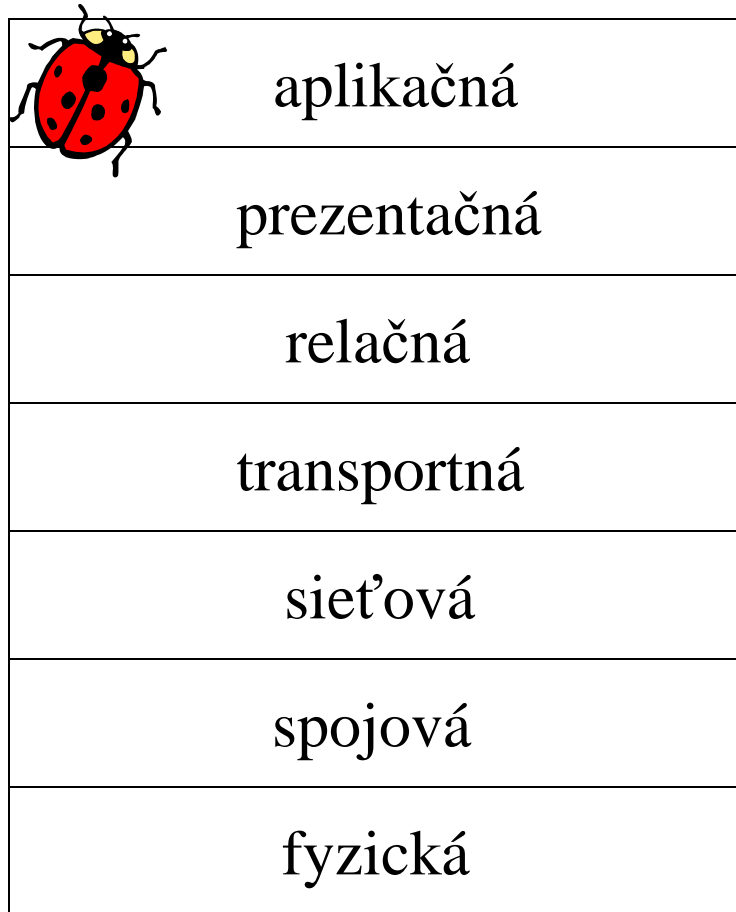
logické adresy, routovanie, packety

Fyzické adresy MAC a LCC napr
konflikt pri vysielaní framu

Rieši fyzické záležitosti, popisuje
médium po ktorom sa komunikuje

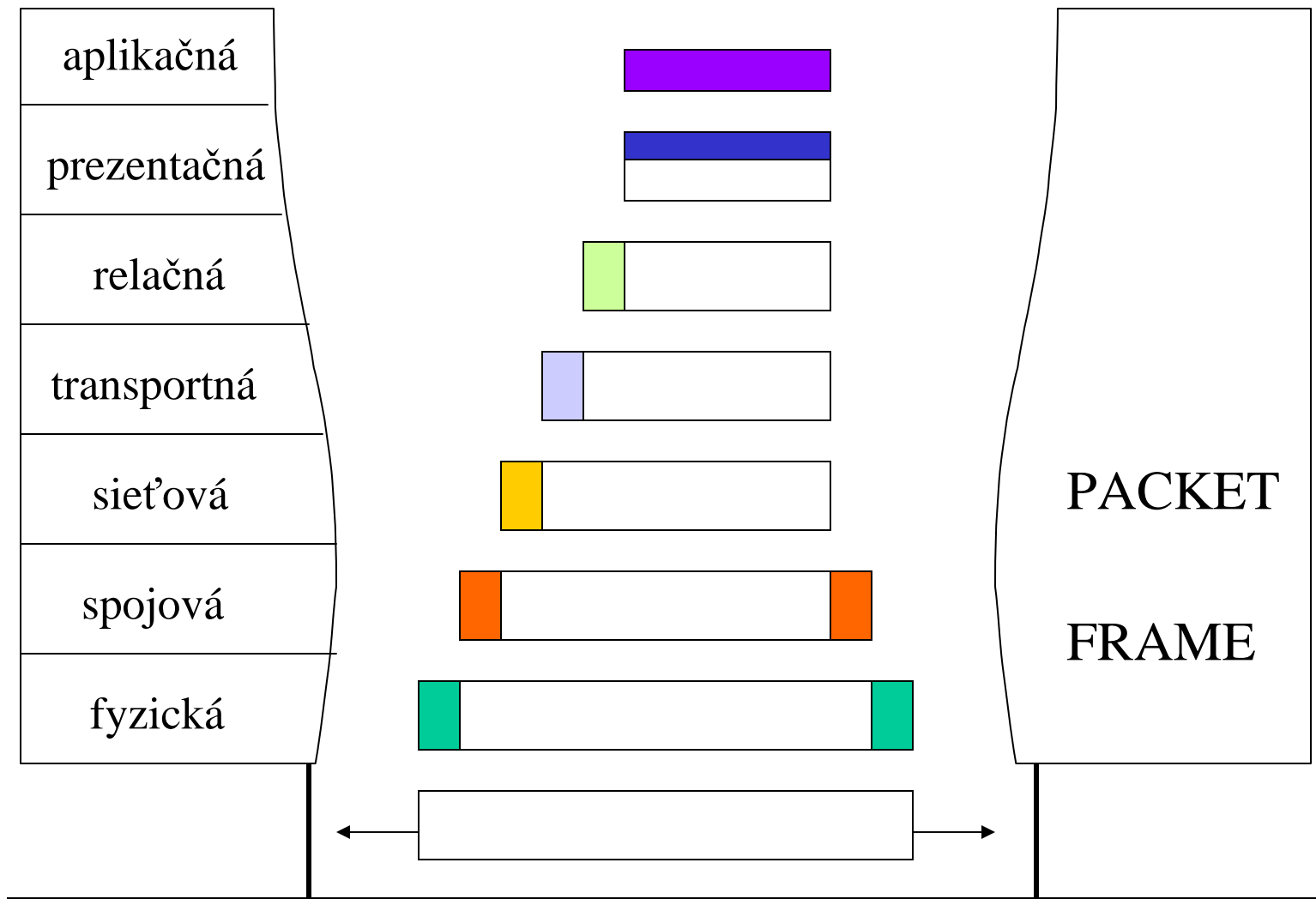
OSI model

LAN/WAN



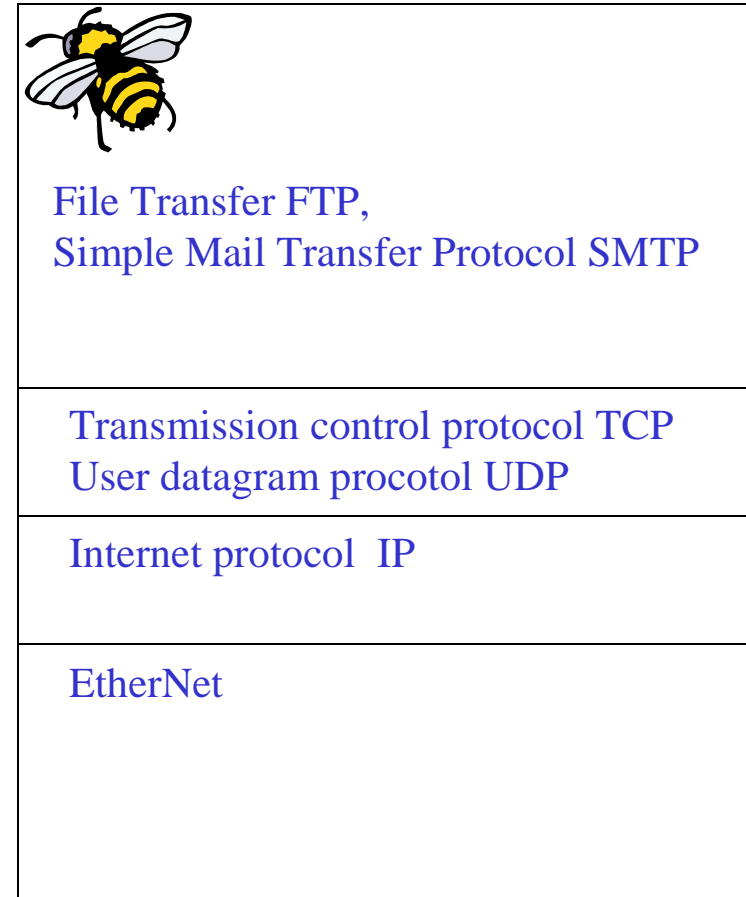
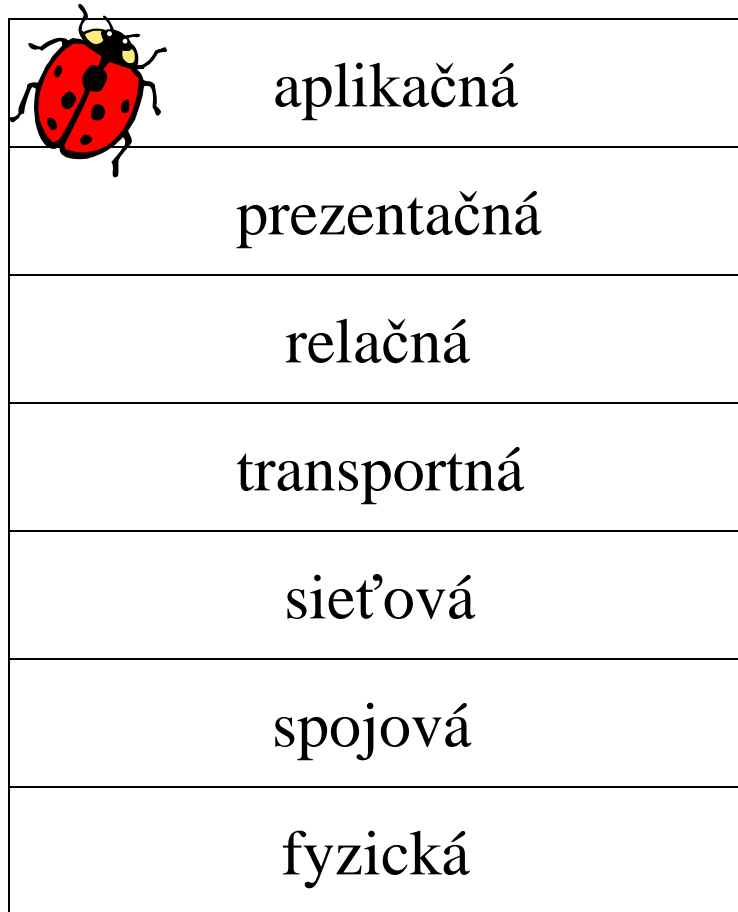
OSI model

LAN/WAN



OSI model

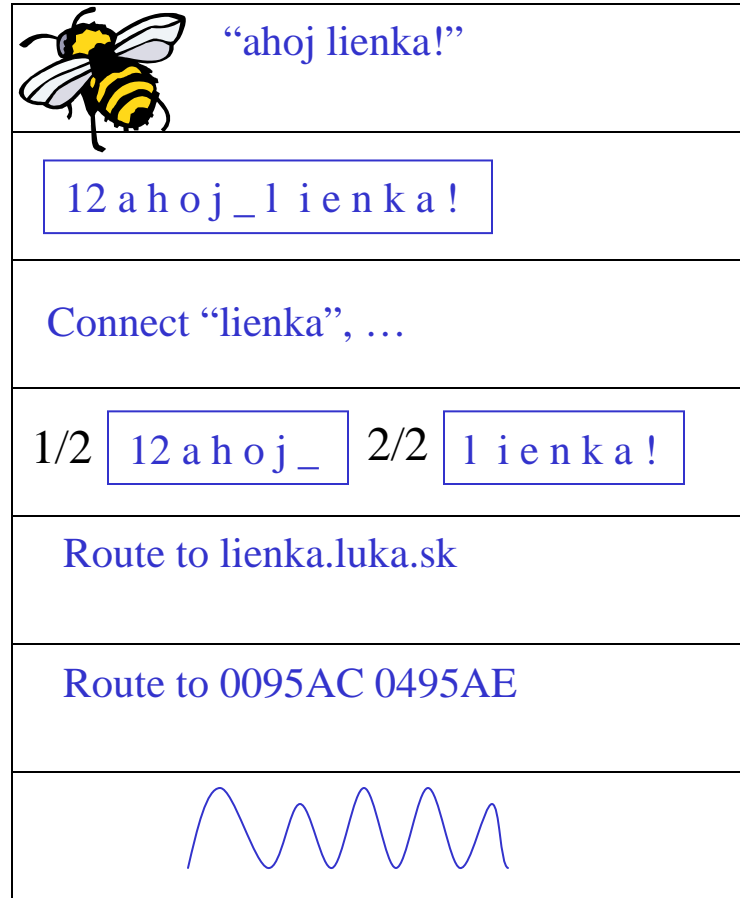
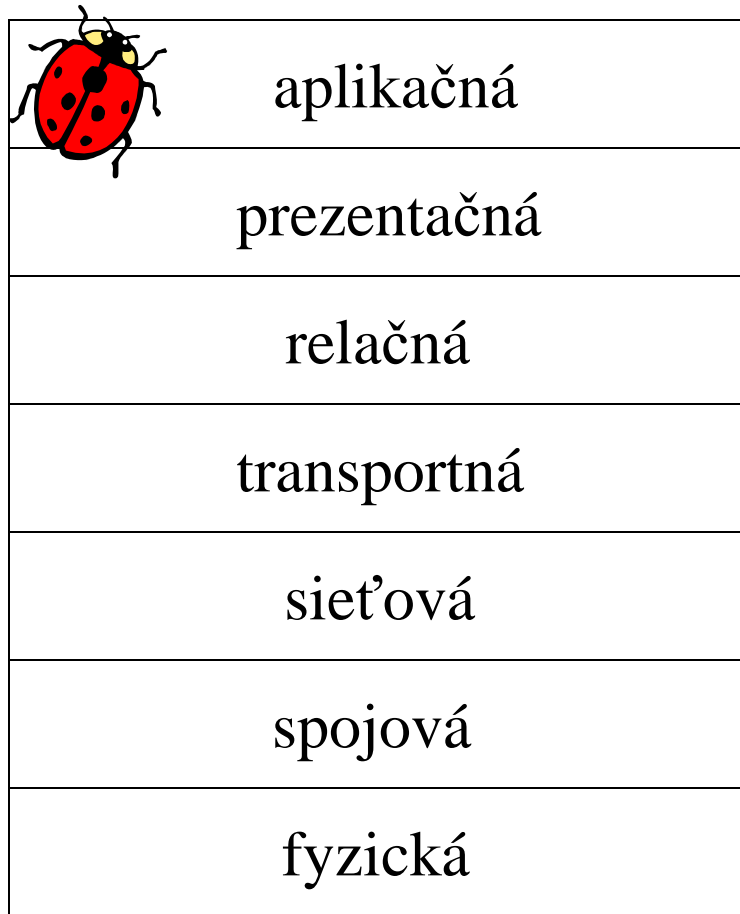
LAN/WAN



Internet

LAN/WAN

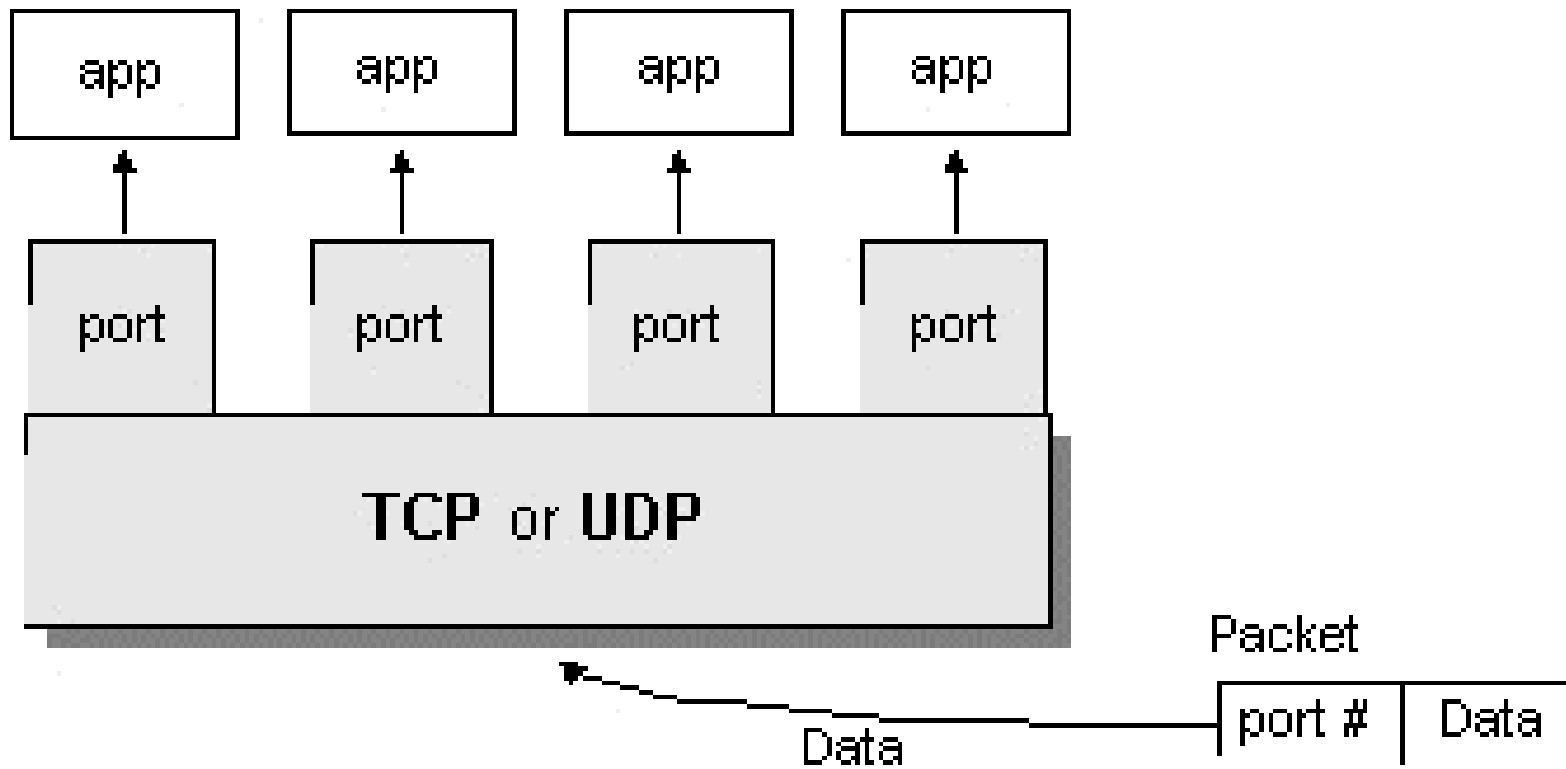
TCP/IP



Internet

LAN/WAN

TCP/IP



0 – 1023 - 65535

TCP/IP

```
import java.io.*;
import java.net.*;
```

server

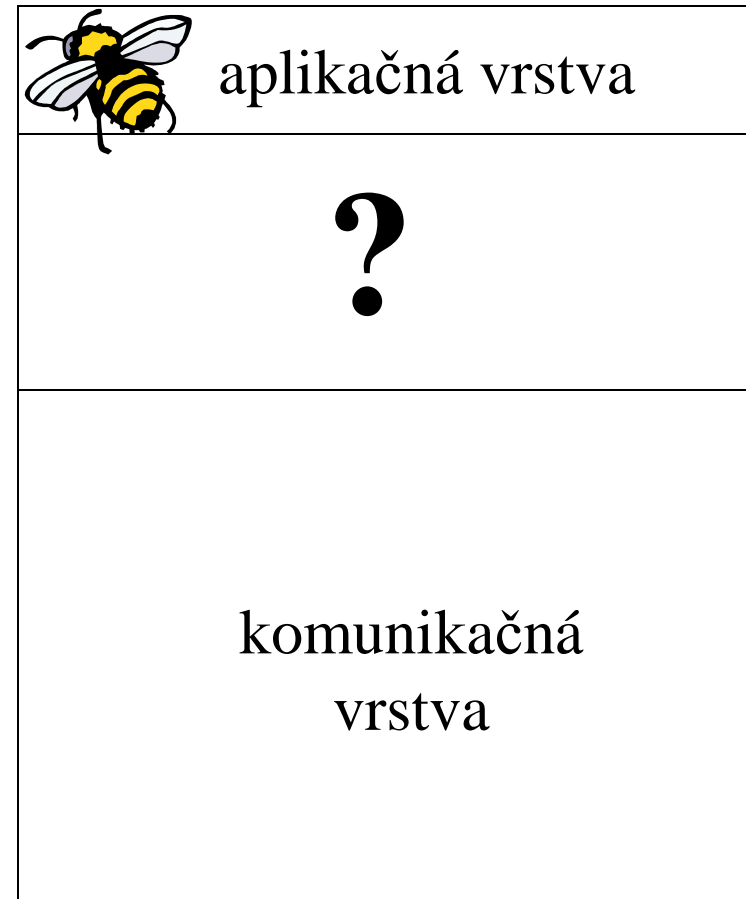
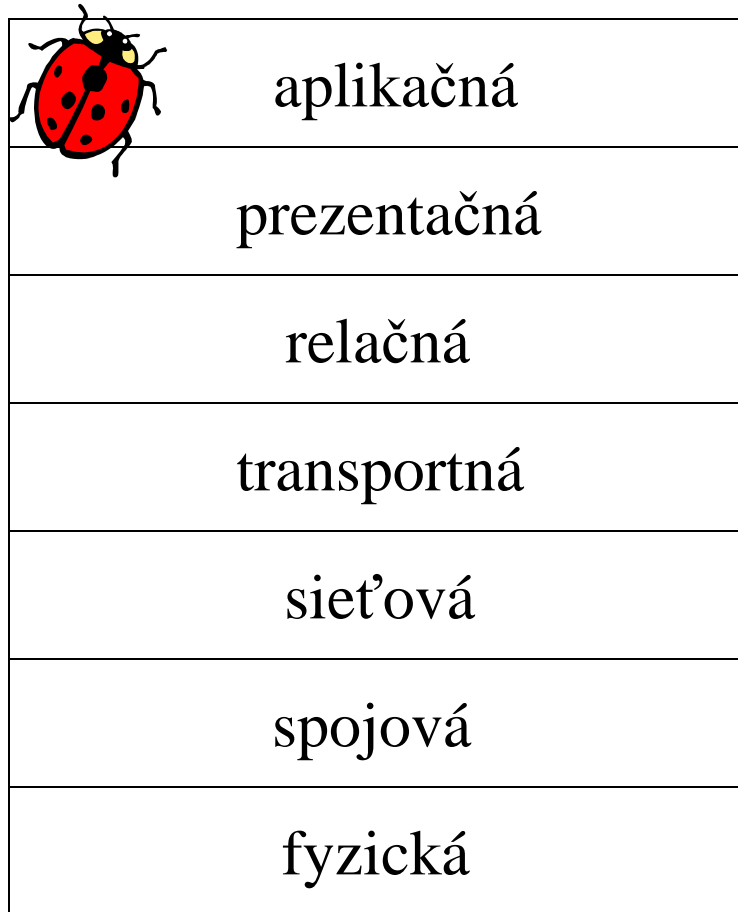
```
public class Server {
    public static final int PORT = 7171;

    public static void main(String[] args) throws IOException {
        ServerSocket s = new ServerSocket(PORT);
        System.out.println("Started: " + s);
        try {
            Socket socket = s.accept();
            try {
                System.out.println("Connection accepted: " + socket);
                BufferedReader in = new BufferedReader( new InputStreamReader(socket.getInputStream()));
                PrintWriter out = new PrintWriter(new BufferedWriter(new OutputStreamWriter(socket.getOutputStream())), true);
                while (true) {
                    String str = in.readLine();
                    if (str.equals("END")) break;
                    System.out.println("Echoing: " + str);
                    out.println(str);
                }
            } finally {
                System.out.println("closing...");
                socket.close();
            }
        } finally {
            s.close();
        }
    }
}
```

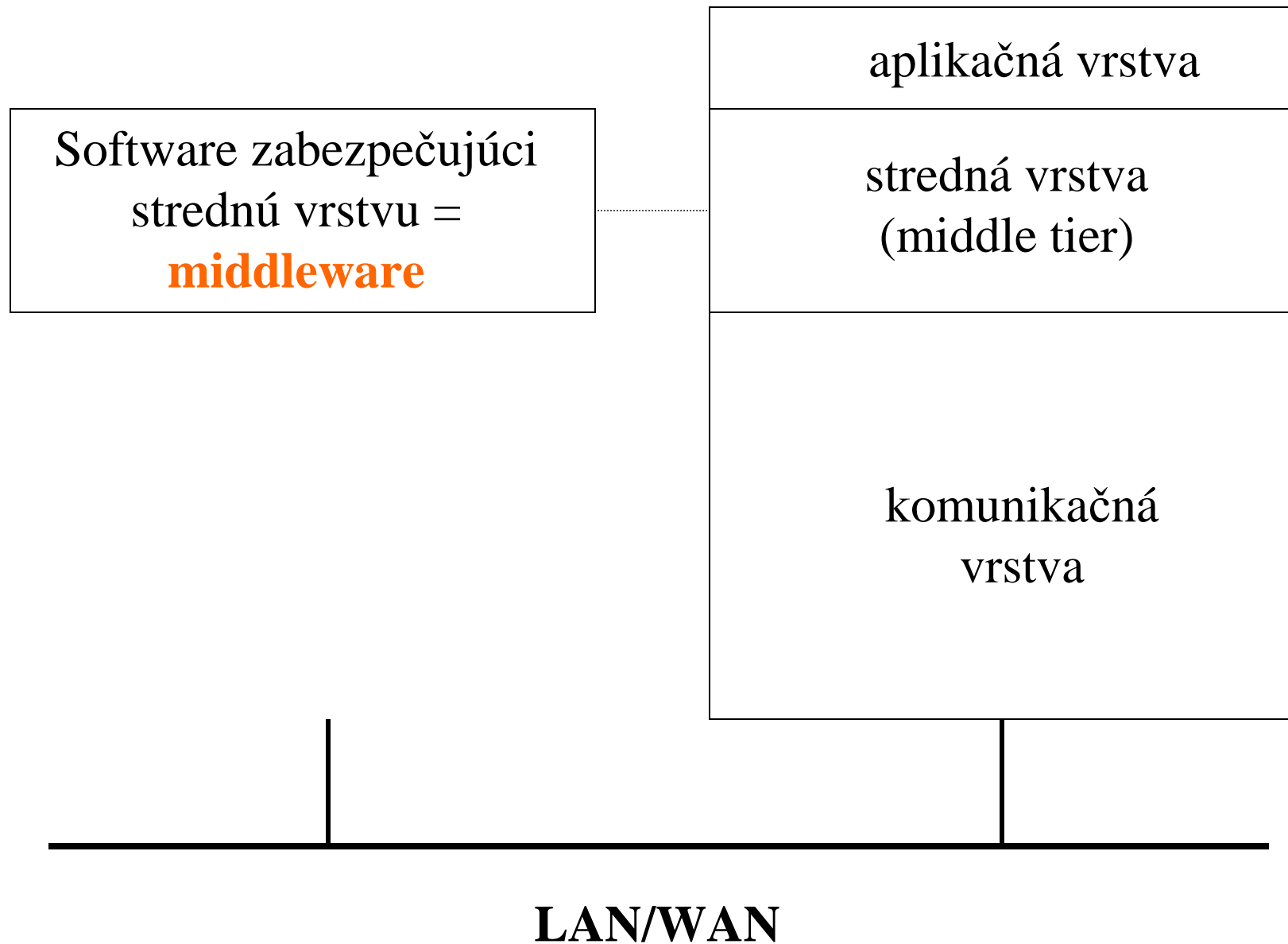
client

```
import java.io.*;
import java.net.*;

public class Client {
    public static void main(String[] args) throws IOException {
        InetAddress addr = InetAddress.getByName("localhost");
        System.out.println("addr = " + addr);
        Socket socket = new Socket(addr, Server.PORT);
        try {
            System.out.println("socket = " + socket);
            BufferedReader in = new BufferedReader(new InputStreamReader(socket.getInputStream()));
            PrintWriter out = new PrintWriter(new BufferedWriter(new OutputStreamWriter(socket.getOutputStream())), true);
            for (int i = 0; i < 10; i++) {
                out.println("howdy " + i);
                String str = in.readLine();
                System.out.println(str);
            }
            out.println("END");
        } finally {
            System.out.println("closing...");
            socket.close();
        }
    }
}
```



LAN/WAN



Middleware

distribuované objekty

služby



správy

transakcie

Middleware

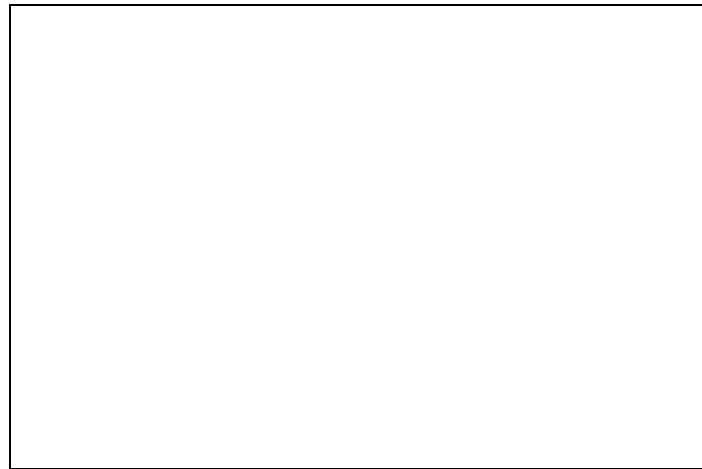
CORBA-POA,

RMI, COM+

RMI-IIOP

RPC, CORBA,

Web services



Middleware 2000

SQL

JADE, Aglobe,
Cougar, ...