Yaler – a simple, open and scalable relay infrastructure

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Internet

Computers, connected through Internet protocols.

Display or manipulate **documents**.

http://blog.com/2011-09-15/page.html

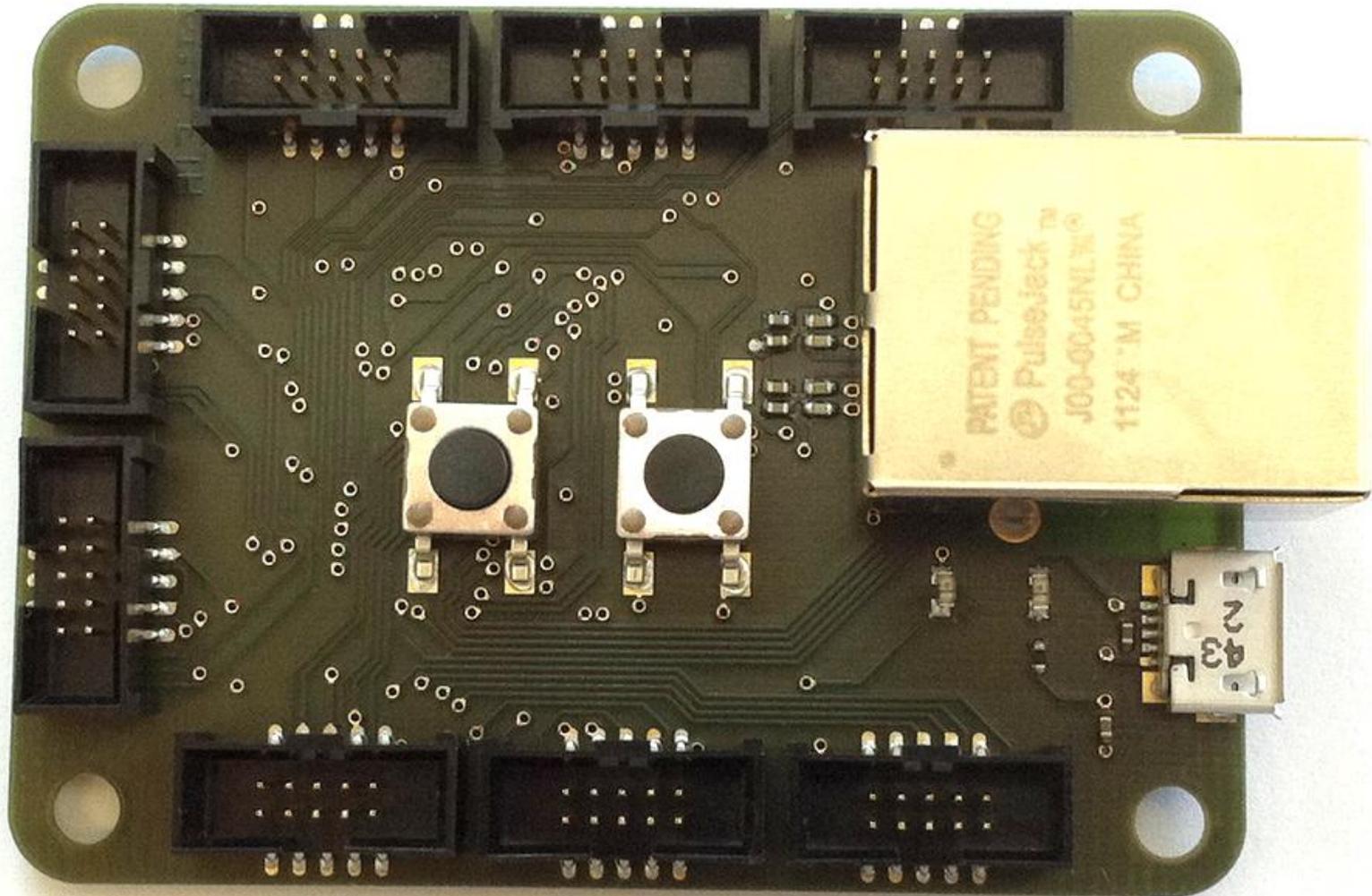# Internet of Things

Computers, **sensors** and **actuators** connected through Internet protocols.

Measure or manipulate **physical properties**.

http://e-home.com/tamberg/kitchen/light

Web server, 2011

Gadgeteer NETMF ARM STM32 w/ Ethernet, Oberon microsystems & CSA Engineering

Access and control

https://my-device/resource

Access(!) and control

https://my-device/resource

IPv4: devices are 2nd class citizens

https://???.???.??.??

Relay!

https://yaler.net/my-device
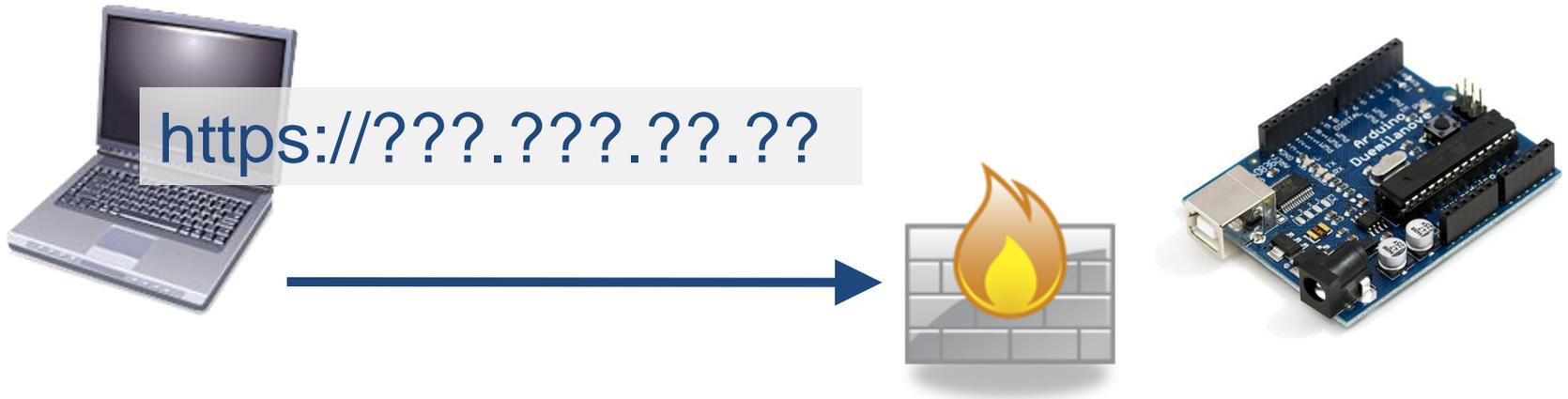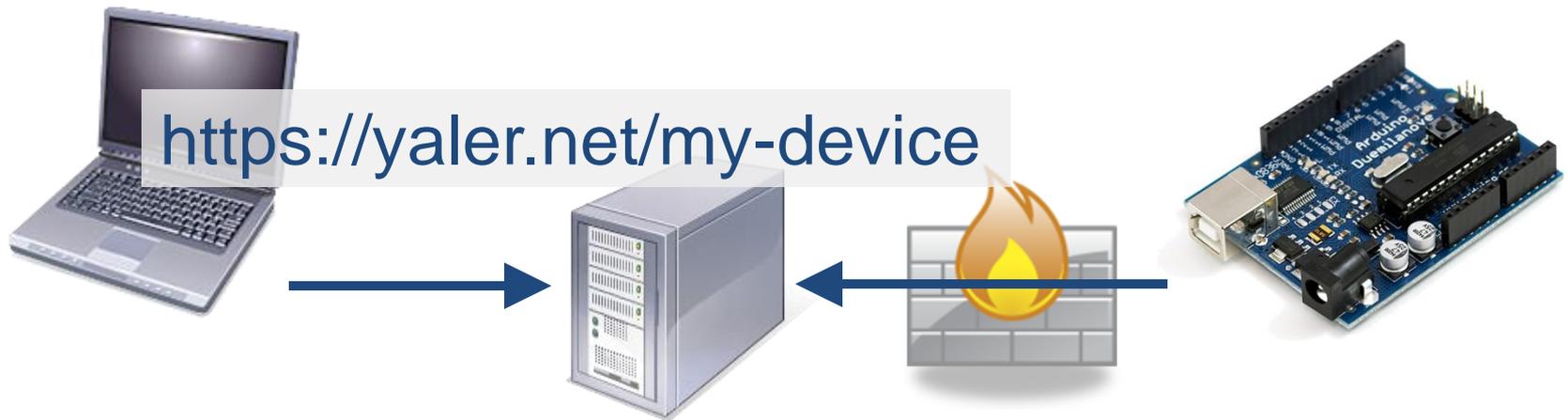
Reverse HTTP

1 **POST** /device-id
Upgrade: PTTH/1.0
Connection: Upgrade
Host: yaler.net

2 **GET** /device-id/resource
Host: yaler.net

3 HTTP/1.1 **101**
Switching Protocols
Upgrade: PTTH/1.0
Connection: Upgrade

4 **GET** /device-id/resource
Host: yaler.net

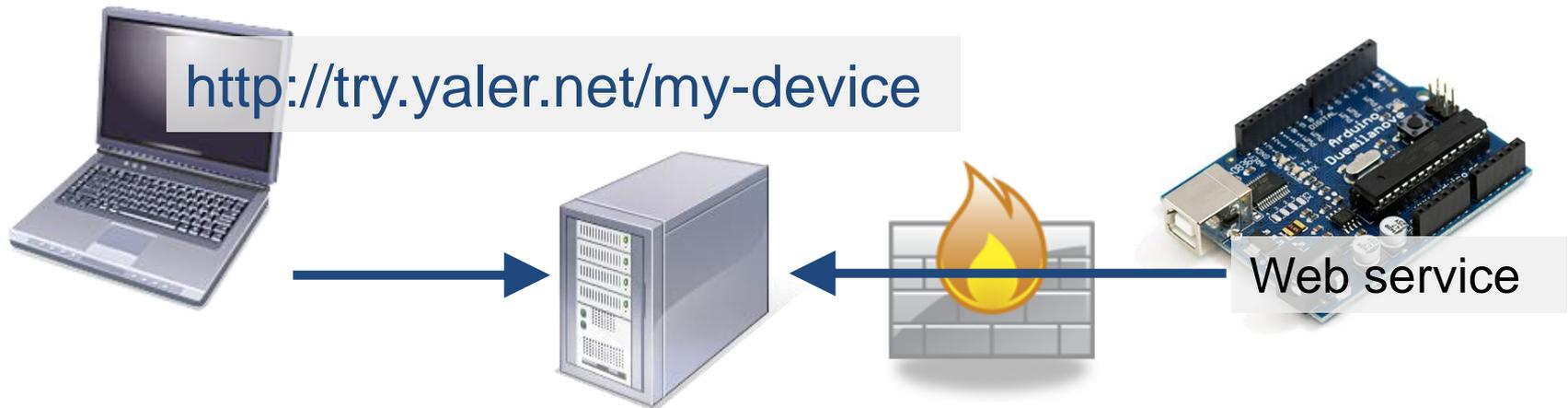**5** HTTP/1.1 **200** OK
{ "feed": [{ "entry": ...

6 HTTP/1.1 **200** OK
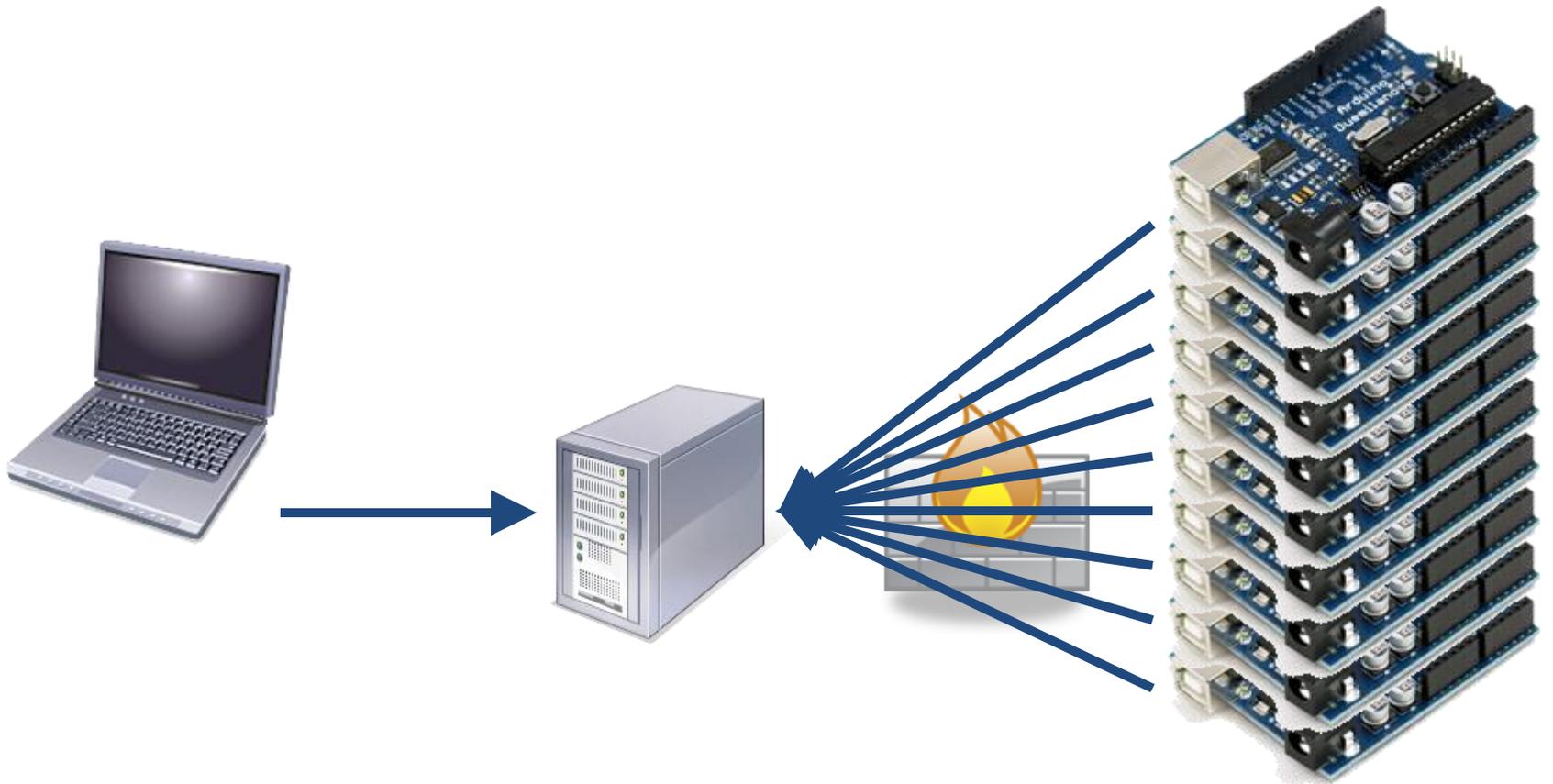{ "feed": [{ "entry": ...

Yaler Library
(e.g. C#)

```
using System.Net.Sockets;
using Yaler.Net.Sockets; // ~20KB

//var l = new TcpListener("127.0.0.1", 80);
var l = new YalerListener(
    "try.yaler.net", 80, "my-device");
l.Start();
while (true) {
    Socket k = l.AcceptSocket();
    ...
}
```
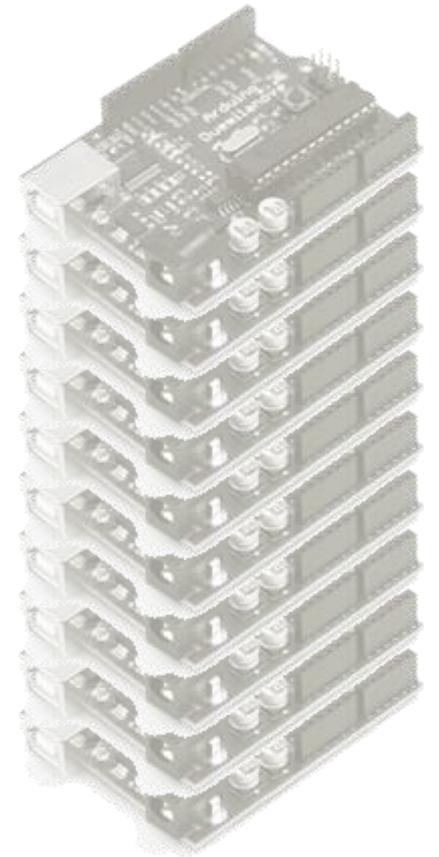
http://try.yaler.net/my-device

Web service

Scalability

Availability

Yaler

A simple, open and scalable relay infrastructure.

Prototype in a **week-end** (2008), version 1.0 after **two years** (2010), high availability, plus **one year** (2011).

Customers use Yaler for

Remote configuration of medical devices.

Access to wireless sensor networks used for structural monitoring.

Generic protocol tunneling.

What we learned

Users want device access to be secure, controlled and **manageable**.

"Low cost data plans limit bytes per day, unwanted HTTP requests = DoS attack"
Reinhard Bischoff, Decentlab

What we learned

Web-enabling a product means the product now represents a **service**.

"Buy Once, Read Everywhere"

http://amzn.com/kindle

What we learned

Adding an Internet connection to a product **can be disruptive** for the company producing it.

Providing **reliable access** is hard – service hosting is often not a core competence.

What we learned

No connection = does not work.

Users judge the **end-to-end** experience.

"Ford's quality ranked 23rd (2010: 5th) due to bad user interface of in-car-entertainment system."

Quote based on NYTimes Wheels Blog article http://goo.gl/2wzXq

Yaler GmbH

To help our customers build a connected product that **just works** – from the first field trial to large scale deployment.

We provide Yaler as a **cloud-hosted**, pay-per-use **service** with premium **enterprise** support.

More info at http://yaler.net/

Thanks for your time   @tamberg