CIGI

CHATHAM
HOUSE
The Royal Institute of
International Affairs

Global Commission on Internet Governance

ourinternet.org

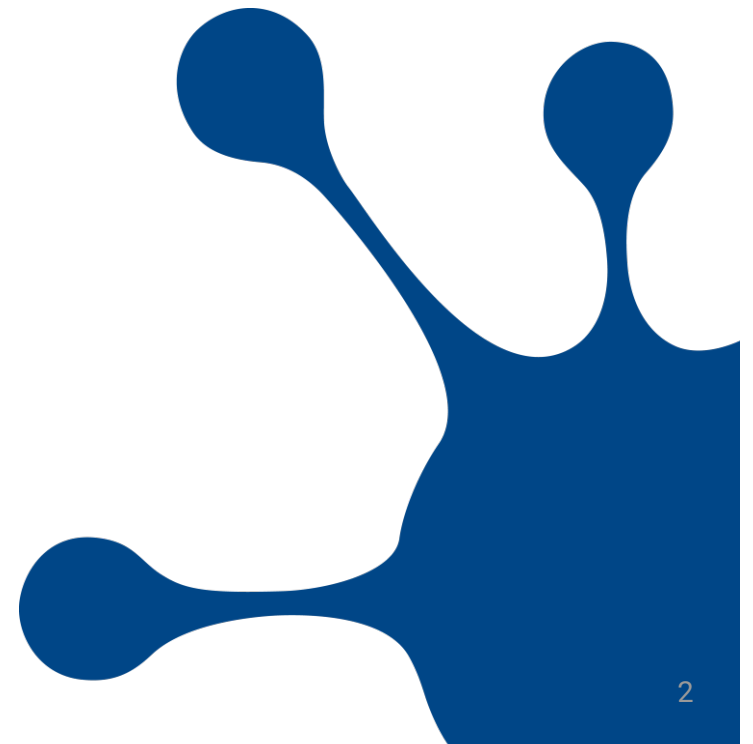# Market-driven Challenges to Open Internet Standards

Patrik Fältström

Patrik Fältström - paf@netnod.se

Teknik- och Säkerhetsskyddschef

Netnod

What is Netnod, and what do we do?

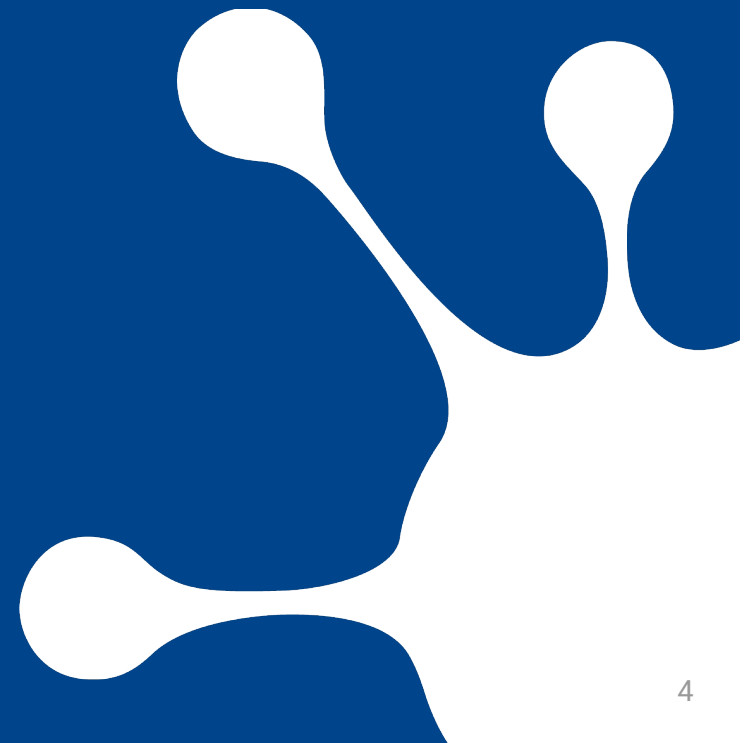By a foundation fully owned incorporation

Not for profit

Provides:

- IX in 6 locations
- DNS in 70 locations in the world
- NTP/PTP-service in 4 locations

Luleå

Sundsvall

Oslo

Stockholm

Göteborg

Köpenhamn/Malmö

WE LIVE IN A NEW WORLD

What was it we were thinking of?

35 years ago...
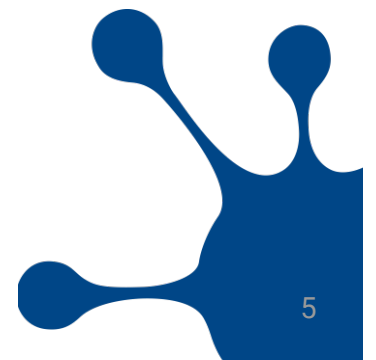
We had one telco

They had some services
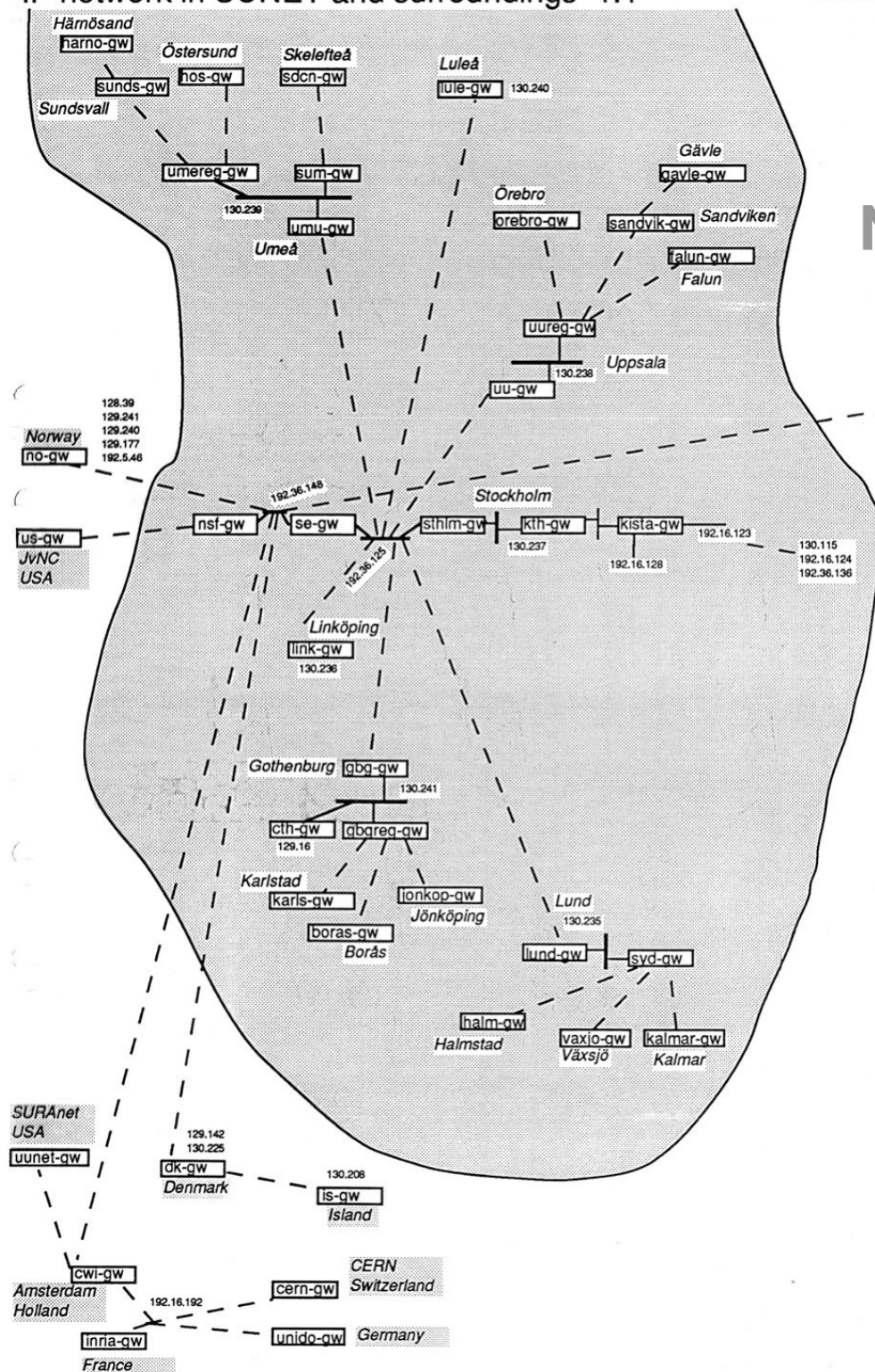
Provided TDM based communication

They sold the end equipment

Most fascinating service was call forwarding when there was no answer

The telco was responsible for everything, and legislation was written to target only them

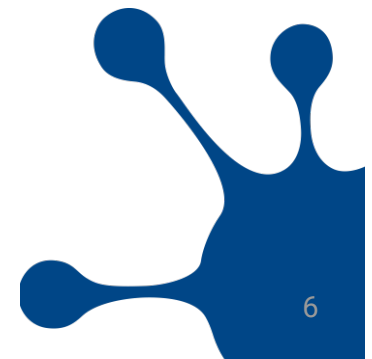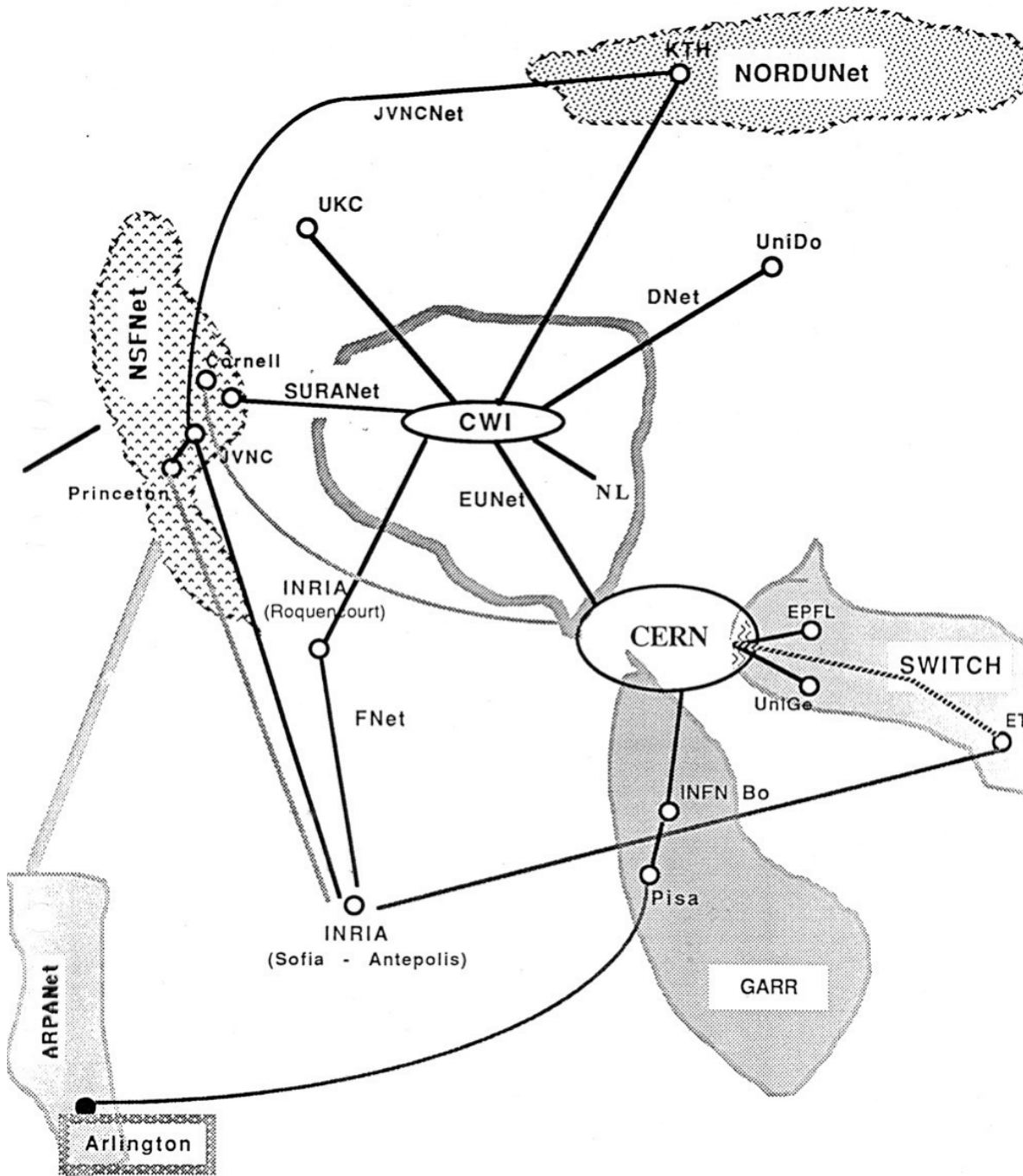And, they where owned by the government

Network in Sweden December 1989

Cisco and µ-vax together with Vitalink bridges created long distance connections

Star-shaped network (64kbps links), with multi-port transceivers as local "LAN" segments

Connection via 64kbps satellite to JvNC in US and to Amsterdam

6

Networks in Europe December 1989

All connections to NSFNet

"Default Network" was pointing at NSFNet

5 connections over the Atlantic: Stockholm, Amsterdam, Sofi-Antipolis and Pisa

4 large networks: NorduNet, EUNet, Switch and Garr

Today a different world

Many telcos

Competition regarding new services

Not only "telephony" uses telco equipment

Internet has taken off

With Internet, global reach at zero cost

Globalization is here

Old and new world

Telephony, Cable TV, Satellite, Mobile

Old
- **Buy connection from one provider**
- **Then buy additional services from provider**

Internet

New
- **Buy connection from one provider**
- **Then buy additional services from anyone**

Old and new world

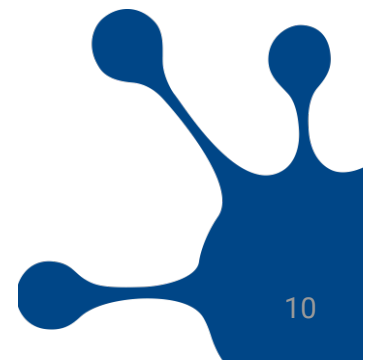Telephony, Cable TV, Satellite, Mobile

Old
- **Buy connection from one provider**
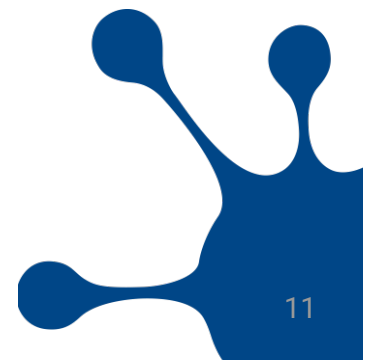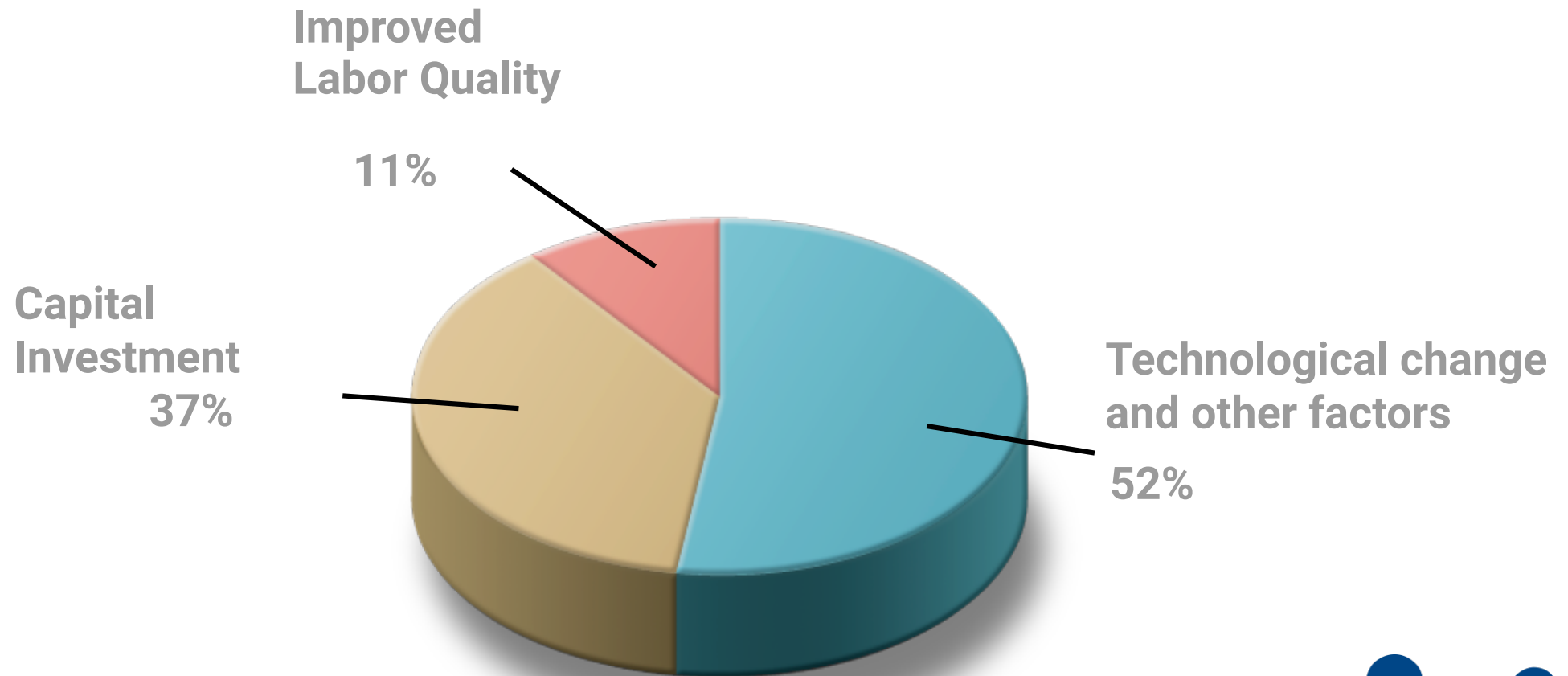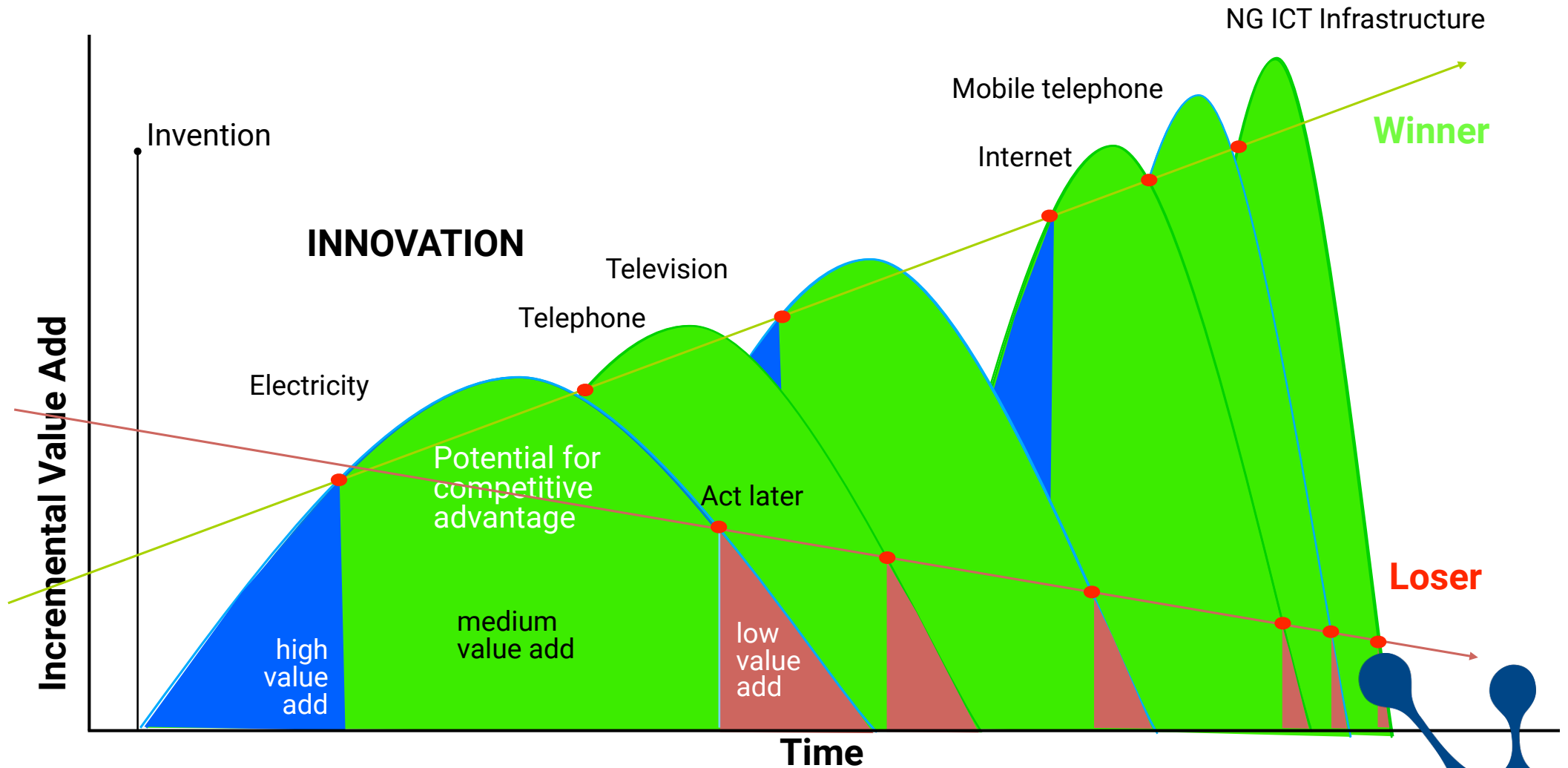- **Then buy additional services from provider**

Internet

New
- **Buy connection from one provider**
- **Then buy additional services from anyone**

What drives productivity?

Improved
Labor Quality

11%

Capital
Investment
37%

Technological change
and other factors

52%

Winners and losers

Incremental Value Add

Invention

INNOVATION

Electricity

Telephone

Television

Internet

Mobile telephone

NG ICT Infrastructure

Winner

Loser

Potential for competitive advantage

Act later

high value add

medium value add

low value add

Time

See also from 2010: http://docplayer.se/3024759-Patrik-faltstrom-distinguished-consulting-engineer-office-of-the-cto-cisco.html

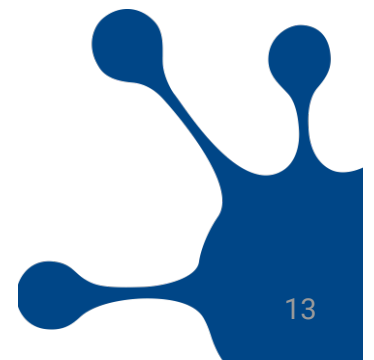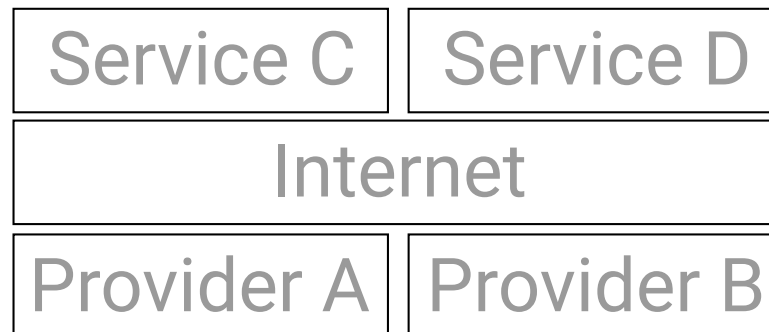## That does not explain change in the value chain...

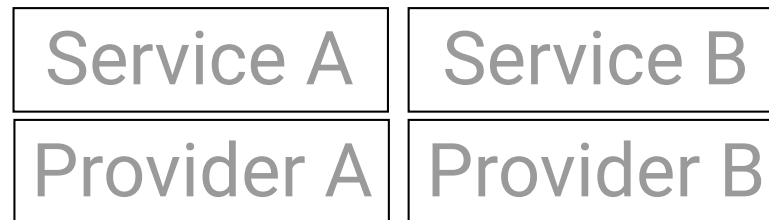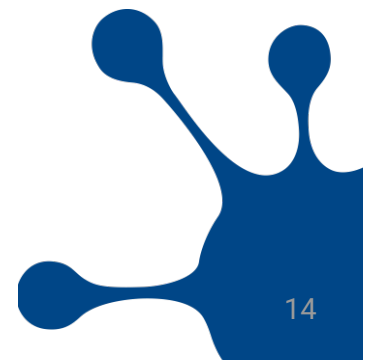Historically we had two layers, and vertically integrated providers

Service A	Service B
Provider A	Provider B

Today, we have three layers, and horizontally separated layers

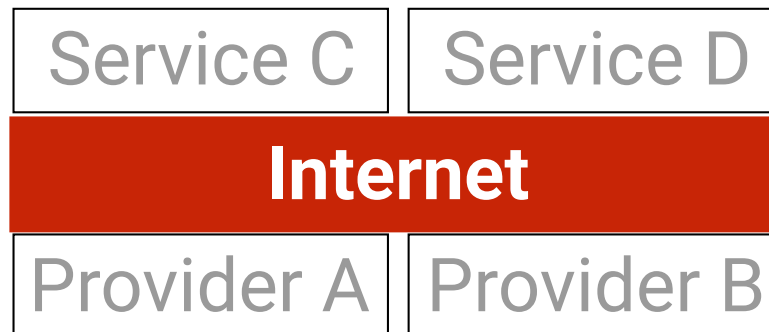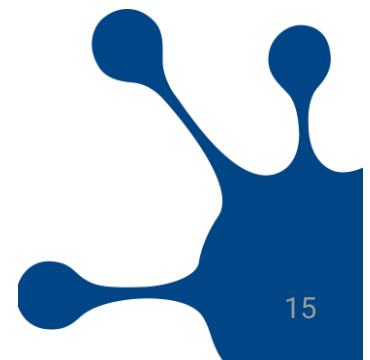| Service C	Service D
Internet	
Provider A	Provider B

That does not explain change in the value chain…

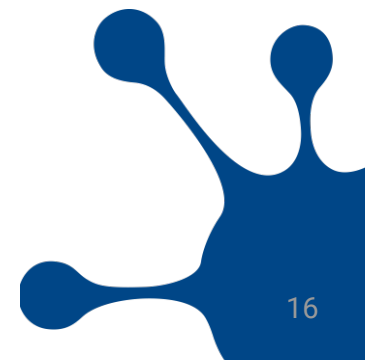Historically we had two layers, and vertically integrated providers

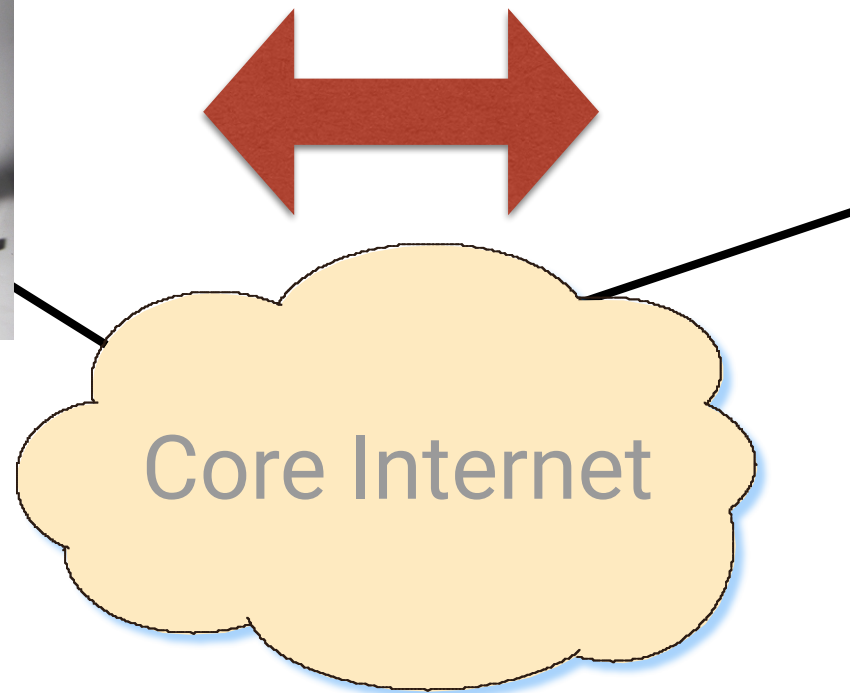| Service A	Service B
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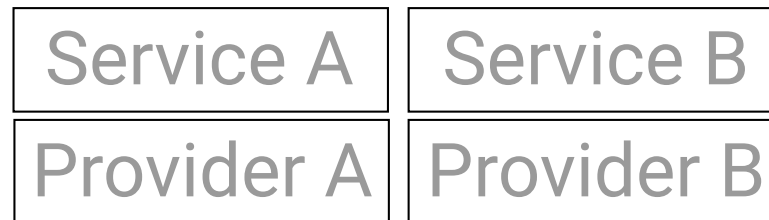
Early days, client - client (east - west)

Core Internet
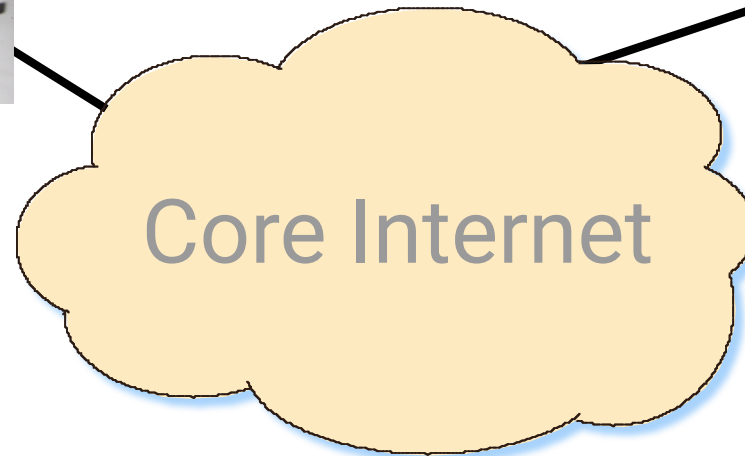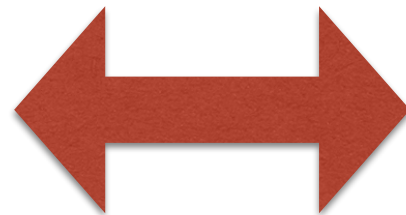
We normally call this *end-to-end*

Core Internet

But also, client - server (north - south)

Core Internet

Still *end-to-end*

Core Internet
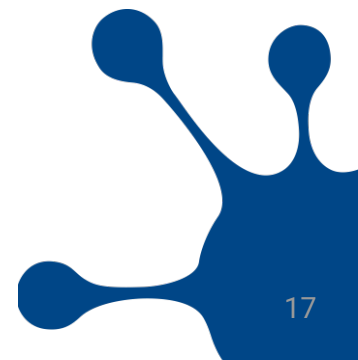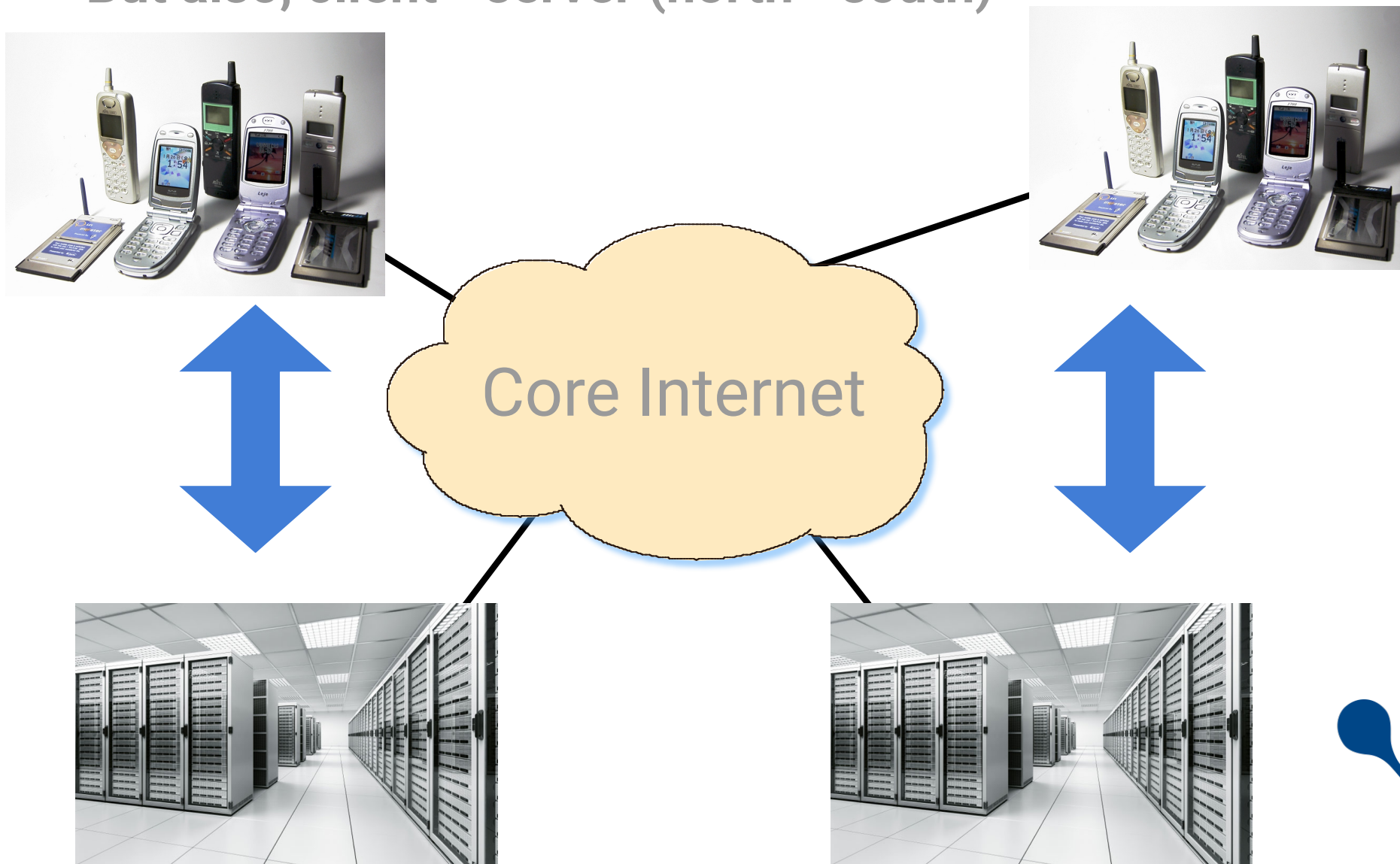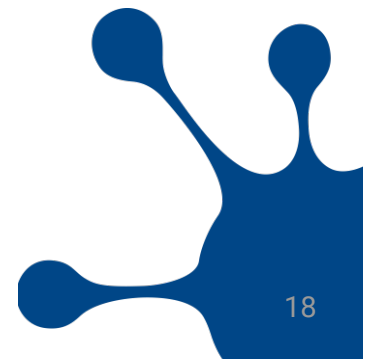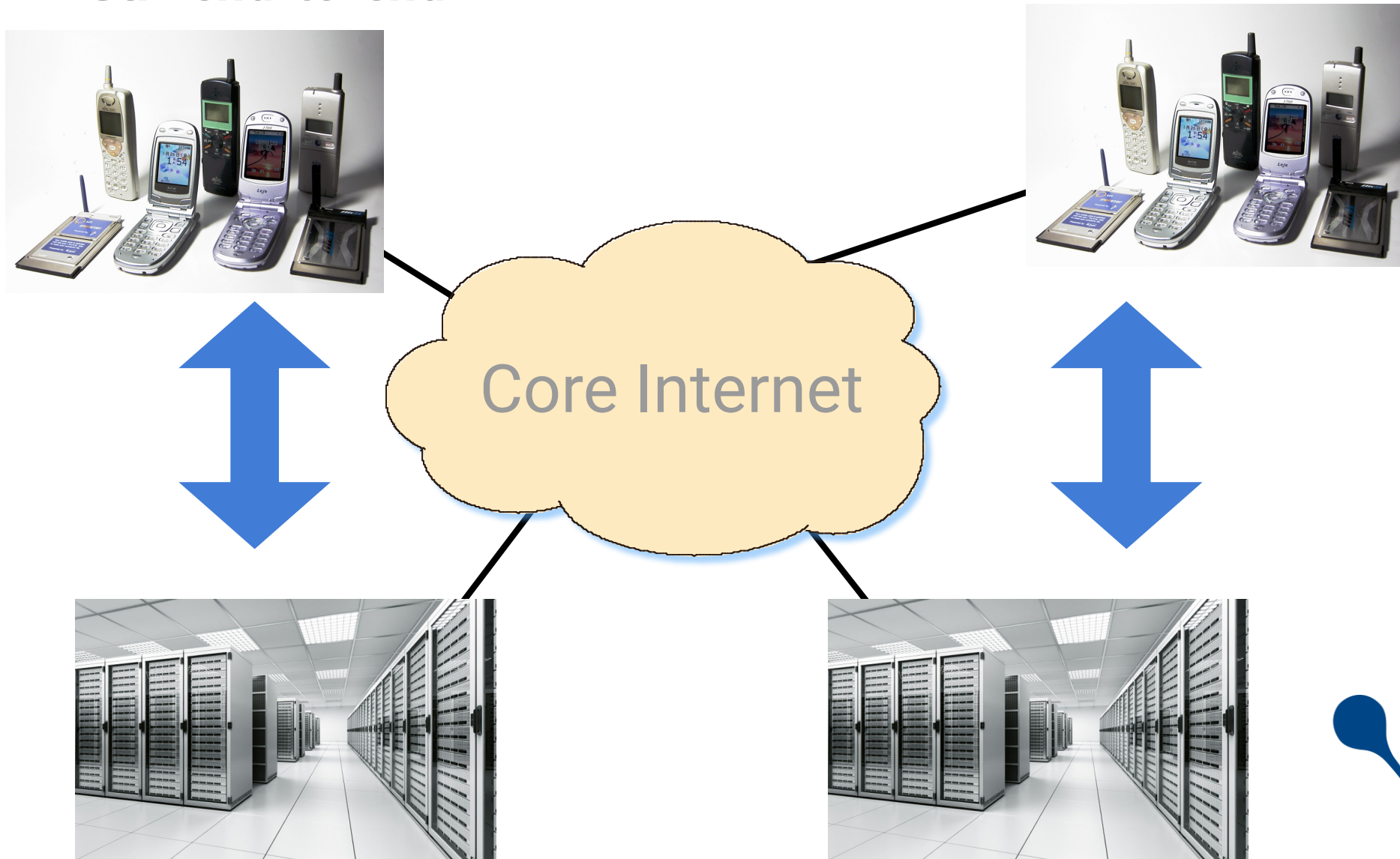
Today, server - server (east - west)

Core Internet
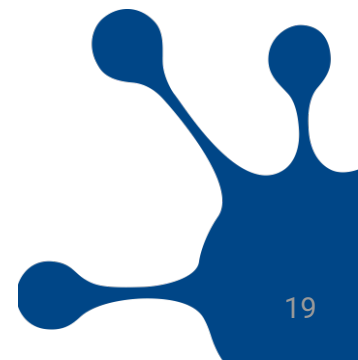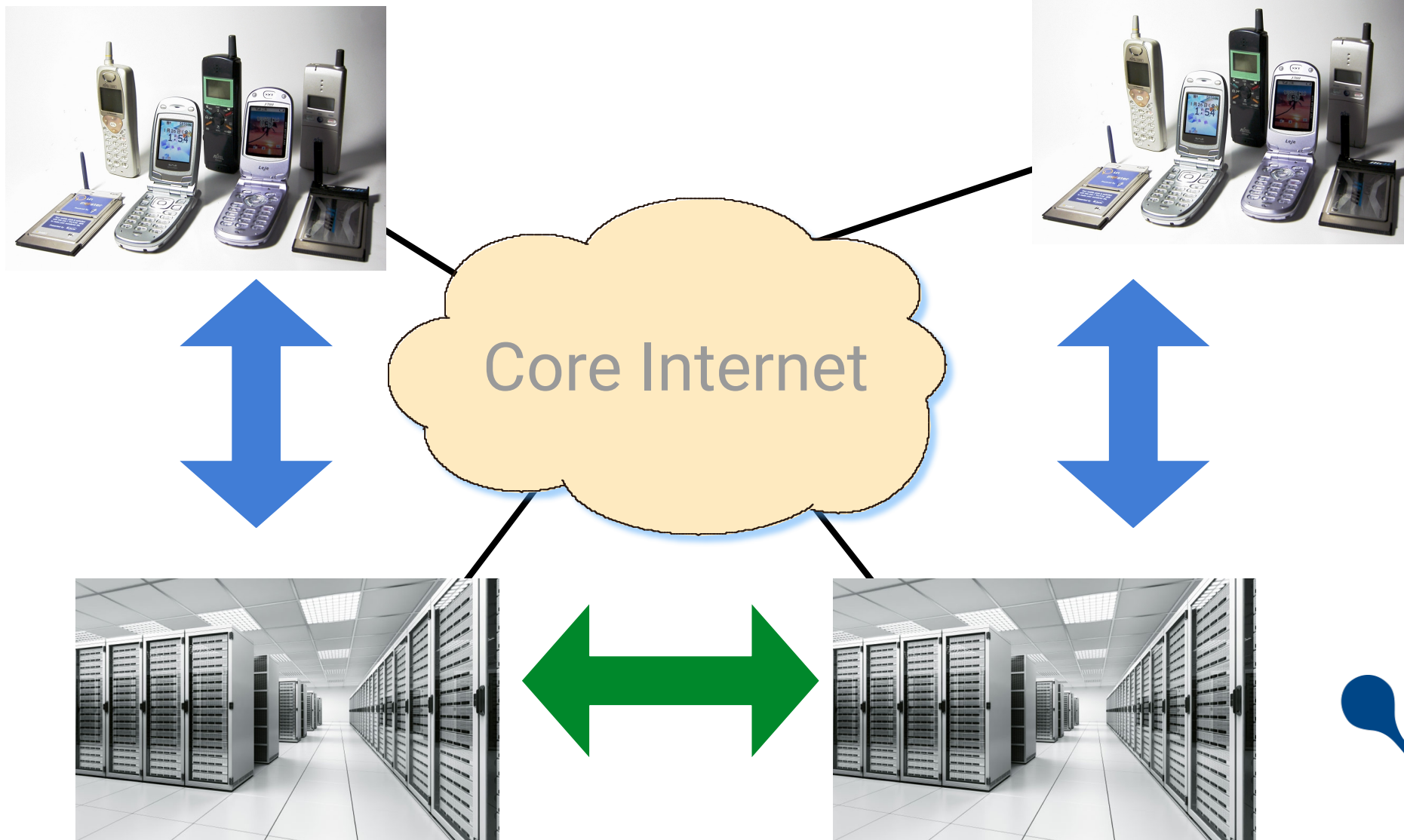
I call this *end-cloud-end*

Core Internet
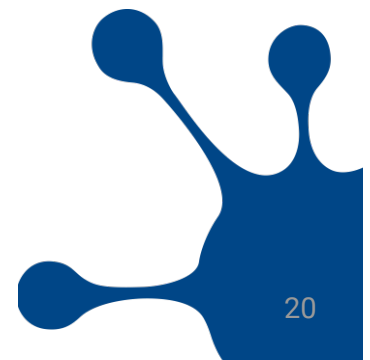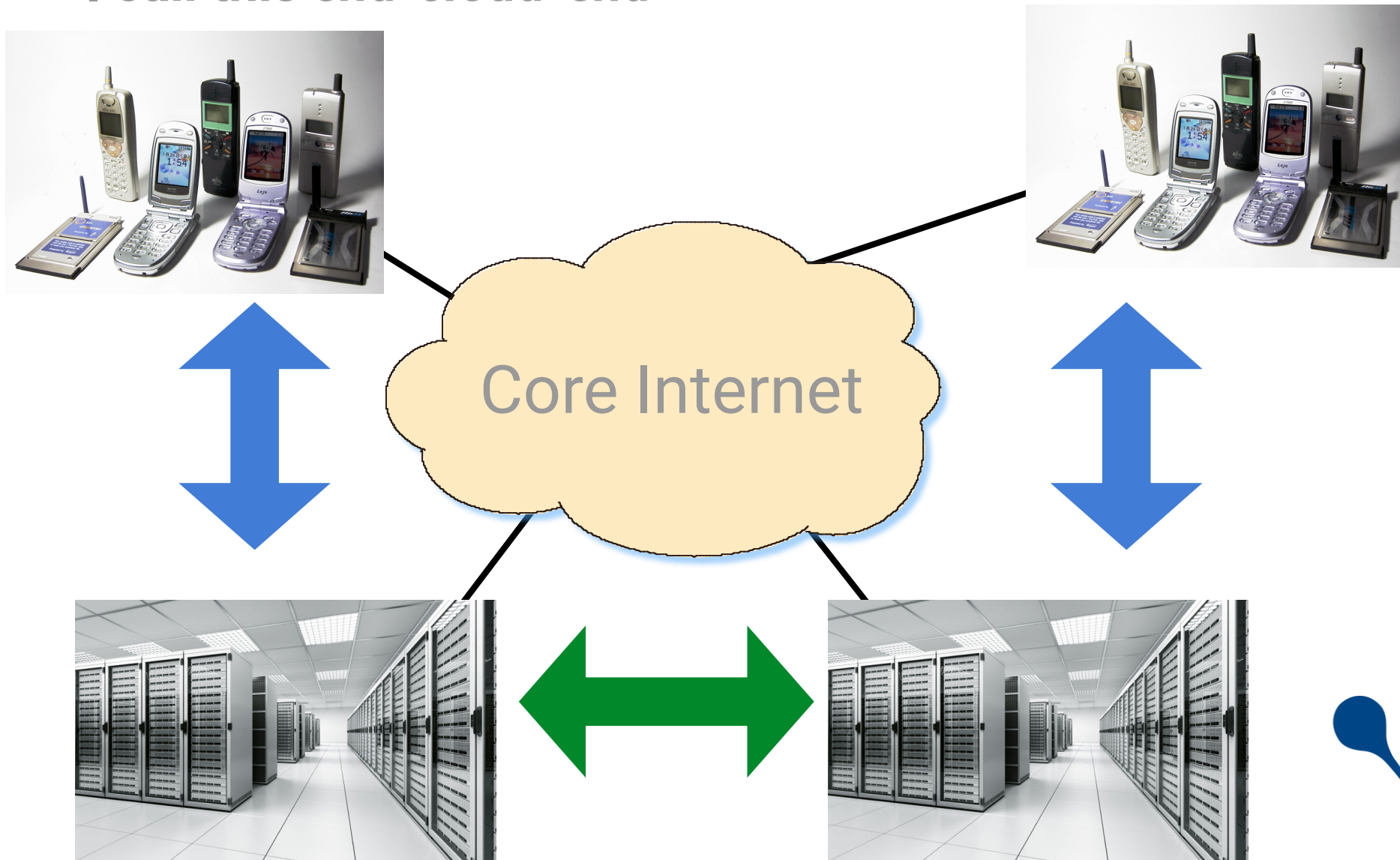
I hope we can go back to *end-to-end*

Core Internet
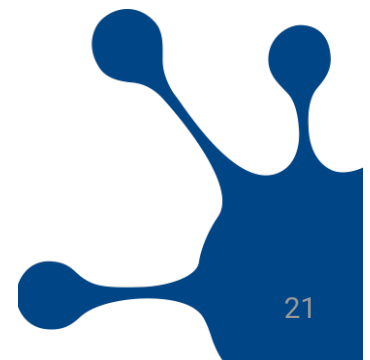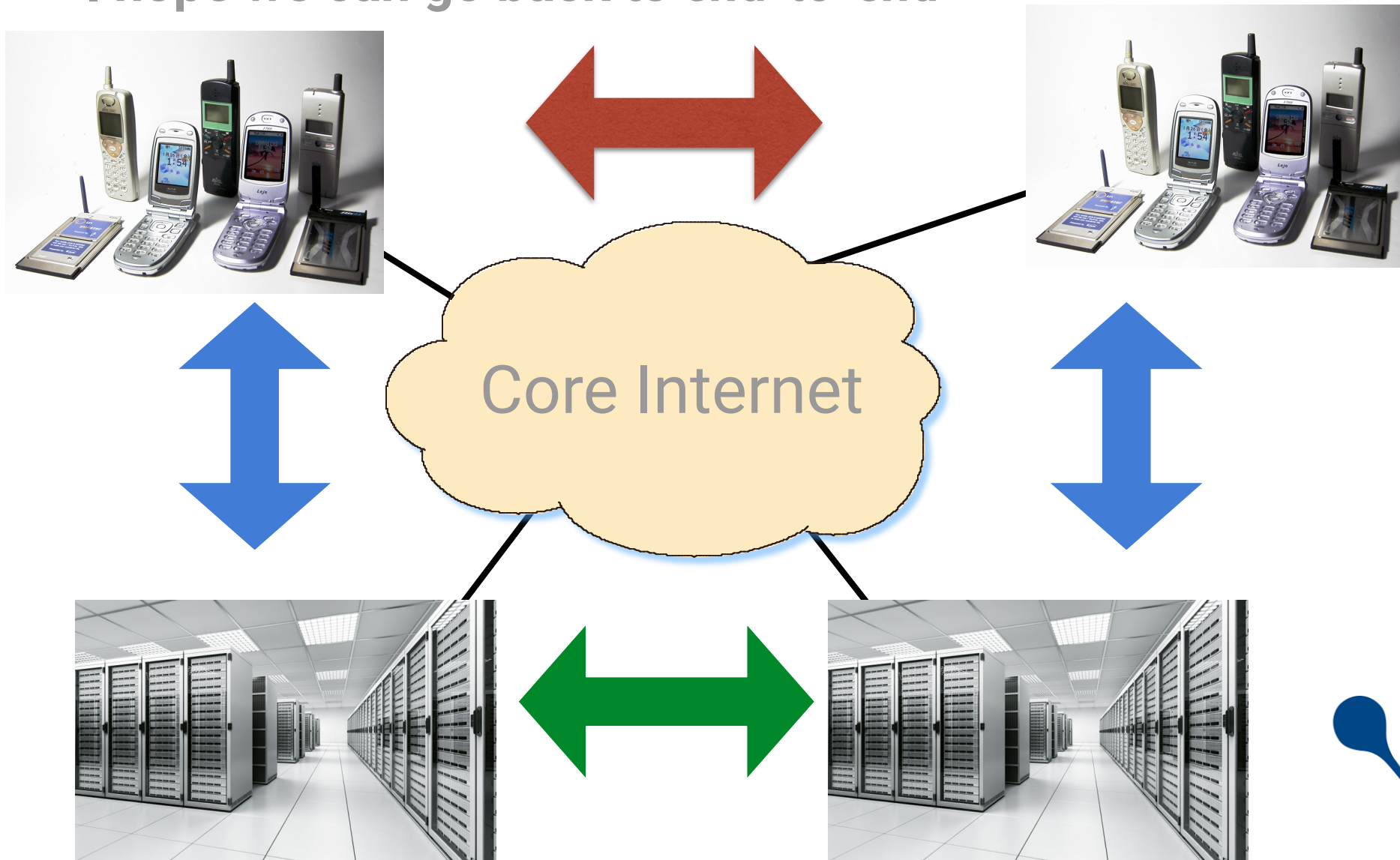
INTERNET OF THINGS

Your lips move, but I can not hear what you are saying
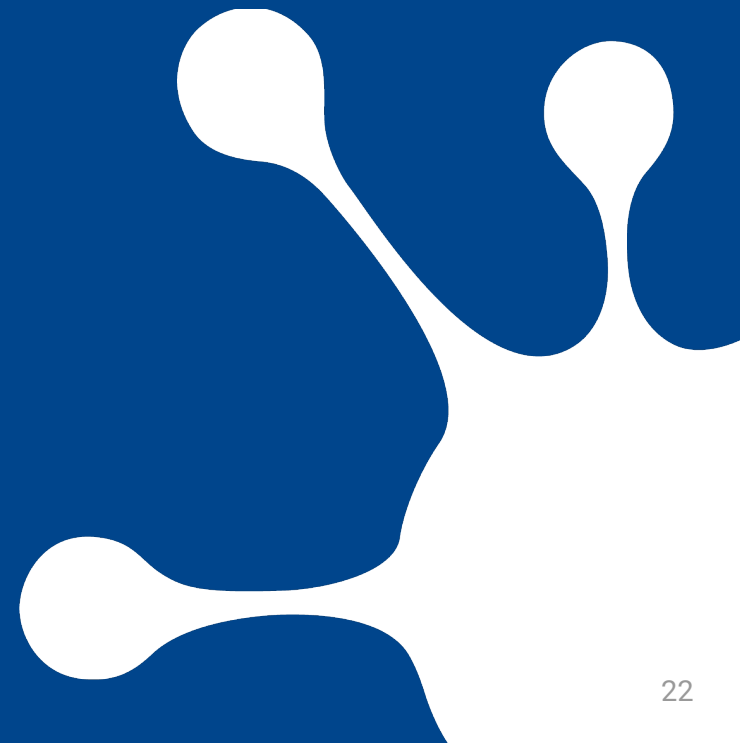
Whats up?

Internet of Things

Is not Internet by definition communication between things?

Is the difference what controls the things?

Do things have to be autonomous to participate in IoT?

Do we not have Internet of Everything?

Is it about data?

Is it about hyperconnecting the world?
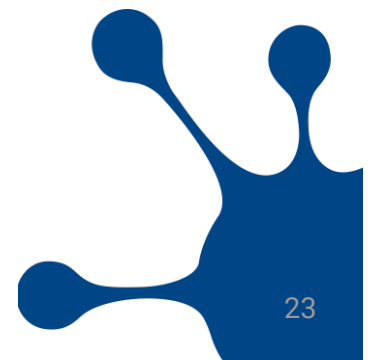
Its old stuff - we have done this before!

Trojan Room Coffee Pot
First webcam - 1991

Carnegie Mellon Internet
Coke Machine (1982, 1990)
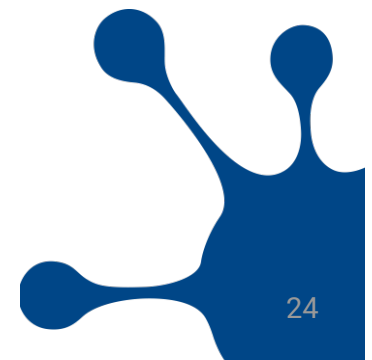
Luckily, Internet Society (ISOC) has created an overview:

The Internet of Things: An Overview
Understanding the Issues and Challenges of More Connected World
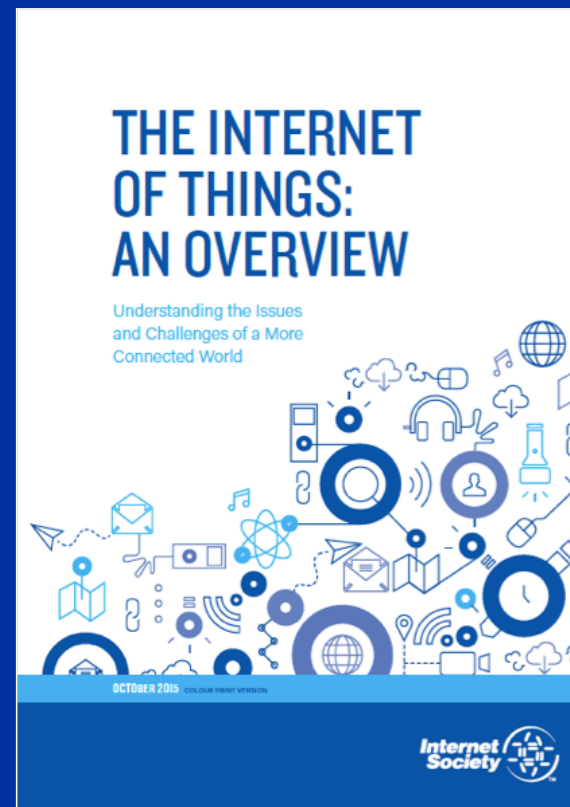
http://www.internetsociety.org/IoT

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THE INTERNET OF THINGS: AN OVERVIEW

Understanding the Issues
and Challenges of a More
Connected World

OCTOBER 2015 COLOUR PRINT VERSION

Internet Society

Why does it happen now?

- Ubiquitous Connectivity

- Computing Economics

- Advances in Data Analytics

- Widespread adoption of IP

- Miniaturization

- Rise of Cloud Computing

http://www.internetsociety.org/doc/iot-overview

THE INTERNET
OF THINGS:
AN OVERVIEW

Understanding the Issues
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Internet
Society

Key Concepts:

- IoT Definitions

- Enabling Technologies

- Connectivity Models

- Transformational Potential

http://www.internetsociety.org/doc/iot-overview

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THE INTERNET OF THINGS: AN OVERVIEW

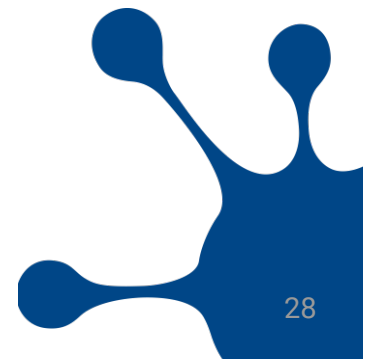Understanding the Issues and Challenges of a More Connected World

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Internet Society™

Issue Areas / Challenges:

- Security

- Privacy

- Interoperability / Standards

- Legal, Regulatory and Rights

- Emerging Economy and Development Issues

http://www.internetsociety.org/doc/iot-overview

Internet of things

I define Internet of Things as the Internet as we know it, but, where at least one of the nodes that communicate acts autonomous, either as a sensor that collect data, or as a node that acts on command, or both.

If that is the definition, what is the problem?
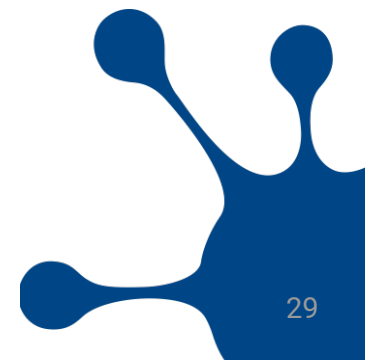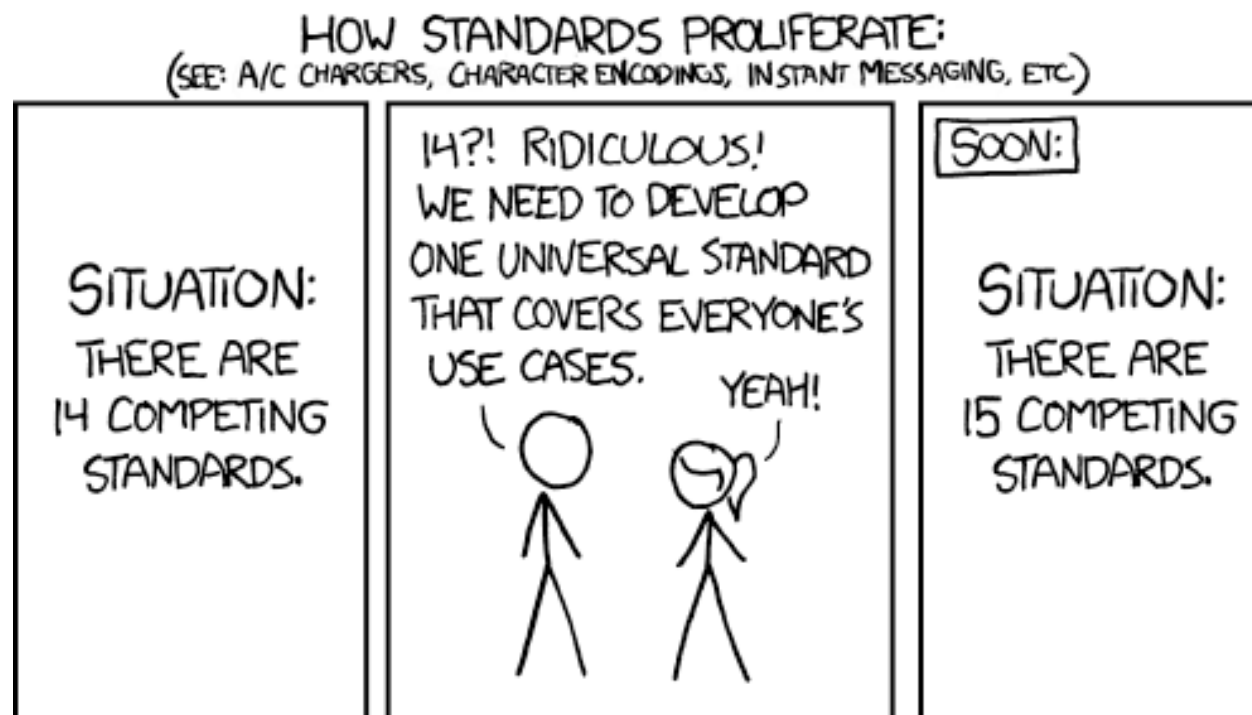
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I define Internet of Things as the Internet as we know it, but, where at least one of the nodes that communicate acts autonomous, either as a sensor that collect data, or as a node that acts on command, or both.

If that is the definition, what is the problem?

Well, the same as we always have had, but exaggerated in many cases:

The ability to communicate

To have proper soft- and hardware

To manage the information correctly
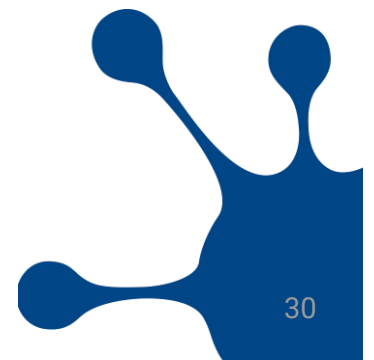
30

Global Commission
on Internet Governance

Market-driven Challenges to Open Internet Standards

Patrik Fältström

Internet fundamentals

- **End to end communication**
- **Global uniqueness**
- **Open Standards**
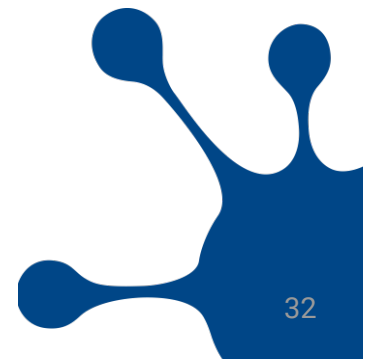
Open Standard Development

- **Ability to Participate in Development of the Standard**
- **Ability to Access Working Documents**
- **Ability to Participate in Decision Making**
- **Ability to Appeal**
- **Ability to Access the Standard**
- **Ability to Implement the Standard**
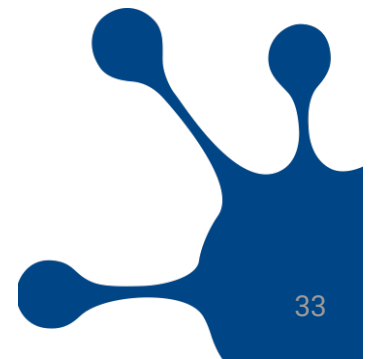
Market forces

- **Sell services, not products**
- *End-Cloud-End* **enables Big Data**
- **Make services sticky**
- **Work in NAT:ed IPv4 environments based on REST**
- **API to the cloud**
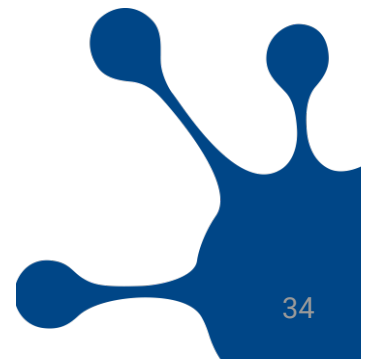
The future / challenges

- Longer term interest wins
- Competition / cooperation grows market
- IPv6 is interesting
- *End-to-end* comes back again
- Devices does not turn into bricks when cloud dies
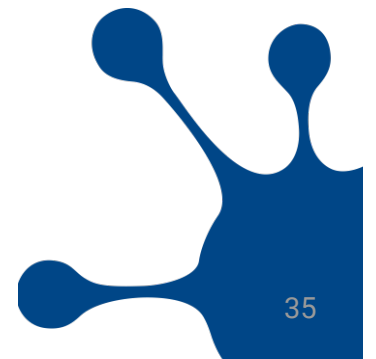- Open standards becomes interesting

Conclusion

Public sector organizations should use every opportunity that arises in procurement, regulation and project funding to require the use of open standards when they are available and to promote their development when they are not. This responsibility is especially important for socially critical systems such as electronic identification and payment schemes, for which the third-party control feature of service silos is unacceptable.

The market forces that favour service-oriented vertical integration over a disintermediated open Internet create strong economic incentives for individual companies to build silos with APIs rather than interoperable devices that implement standard protocols. Countering those forces to preserve the broad economic and social bene ts of an open Internet for its users will require awareness and effort on the part of users and their public sector organizations, and a willingness to take a longer view of their business interests on the part of individual companies and industry consortia.

Market-driven Challenges to Open Internet Standards, Patrik Fältström. Global Commission on Internet Governance. Paper Series: No.33, May 2016. Centre for International Governance Innovation (CIGI) and Chatham House.

https://ourinternet.org/publication/market-driven-challenges-to-open-internet-standards/

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