

*Teletronikk 100 years  
Anniversary seminar 24 November 2004*

*IPfy or perish!*

*.. but what is efficient implementation of the IP philosophy?*

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*Outline:*

- *Overall motivation*
- *IPfication key characteristics*
- *So, why does this happen - any gains at all?*
- *But, the proper steps then?*
- *Any issues still missing - can IP miss out – or completing missing issues?*
- *Concluding remarks*


## Overall motivation (“money talks”)

### Service revenues:

- *broadband services and mobile services commonly expected to be future growth areas*
  - *providing flexible service production apparatus*
  - *reducing time- and cost- to market*

### Cost cutting:

- *all operators/vendors been through consolidation during the latest 3 years*
  - *reducing complexity*
  - *down-sizing non-profit activities (reducing multiplicity)*



*“Digital mastering”  
(applications and content  
on broadband access)*

*“Beyond-voice era”*

*Vodafone: “building once,  
deploying many”*

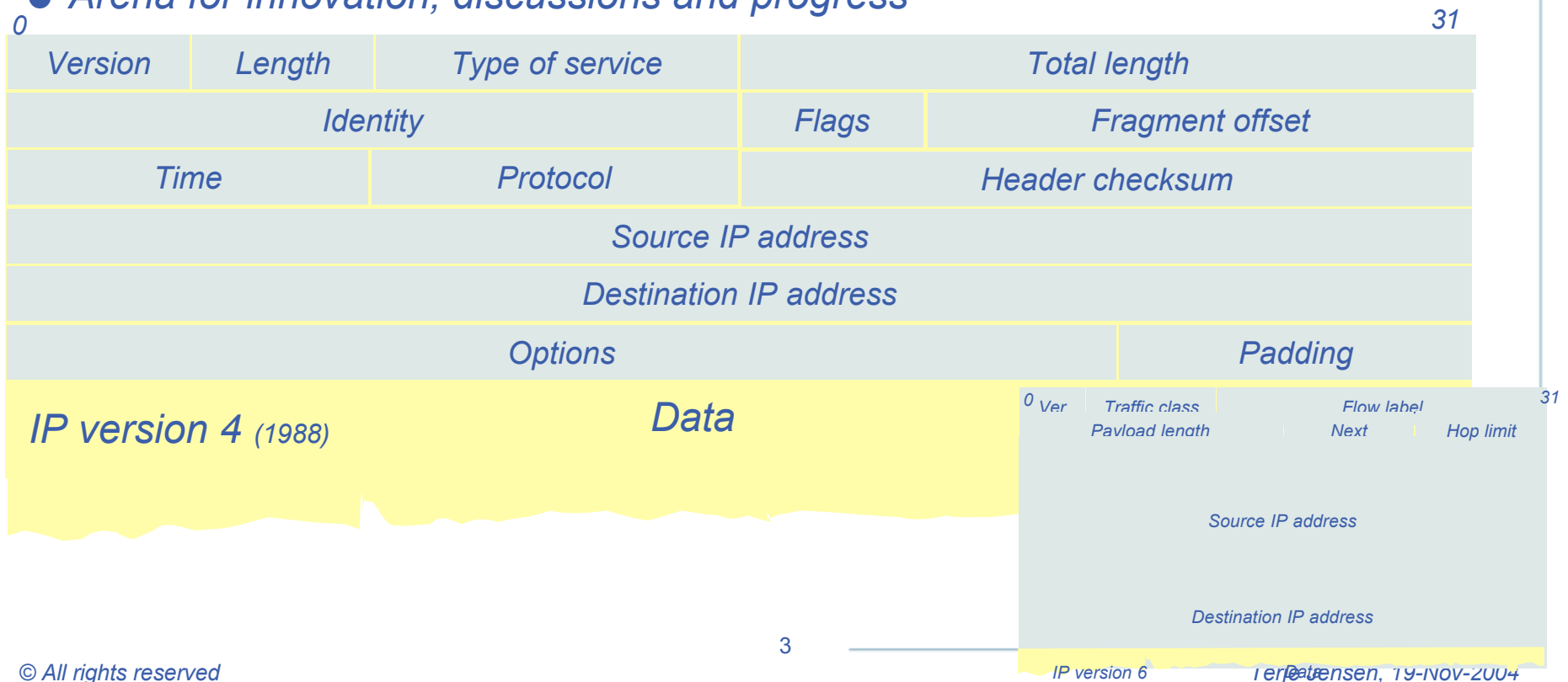
*Layoffs and outsourcing*



# IP key characteristics

## Main features:

- *Datagram service: “unreliable, best-effort, connectionless packet transport”*
- *Simple*
- *Open/standard*
- *Stable core function (packet format)*
- *Arena for innovation, discussions and progress*



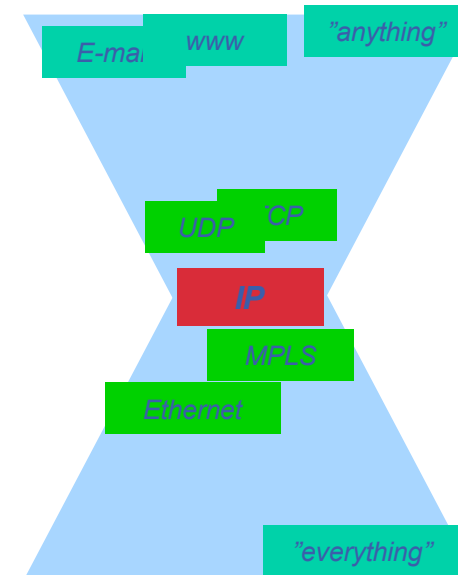
## IP key characteristics

### What do these characteristics provide:

- Common “glue” -> ability to support anything over everything
- Growing implementation activities
- Cross-system realisation -> fixed networks, mobile networks, terminals, consumer electronics, ....
- World-wide presence -> Internet statistics
- Society awareness
- Political attention (basis for knowledge society)

### IPfication:

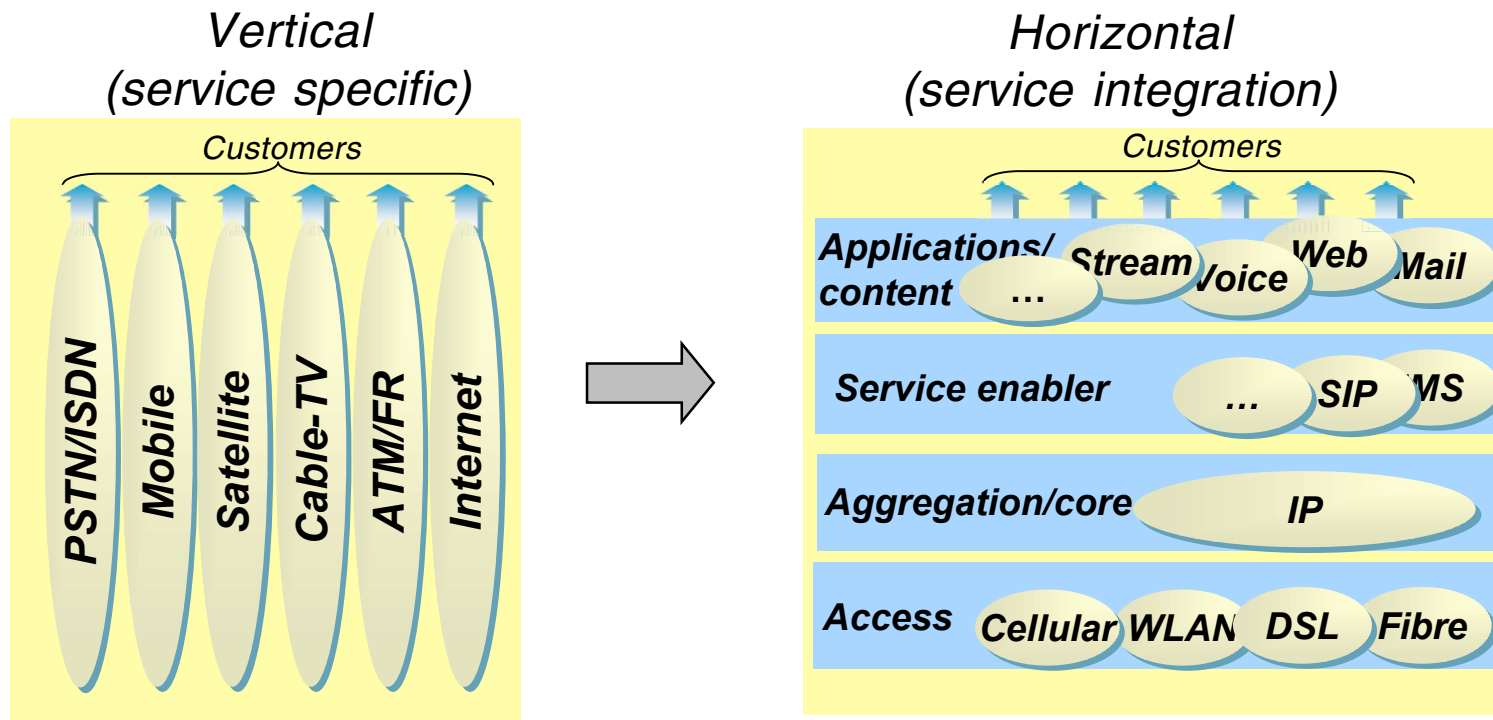
.. simple/good enough – as expected – and cheap...



# IP key characteristics

## Enabling a modular and flexible architecture:

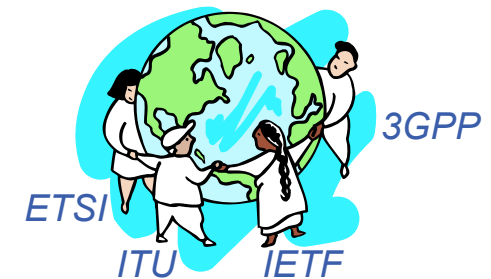
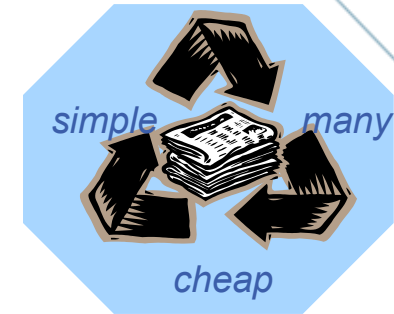
- Any service, any terminal, anywhere, anytime, to anyone



## Why does this happen – any gains?

### The growth cycle – the big gets bigger:

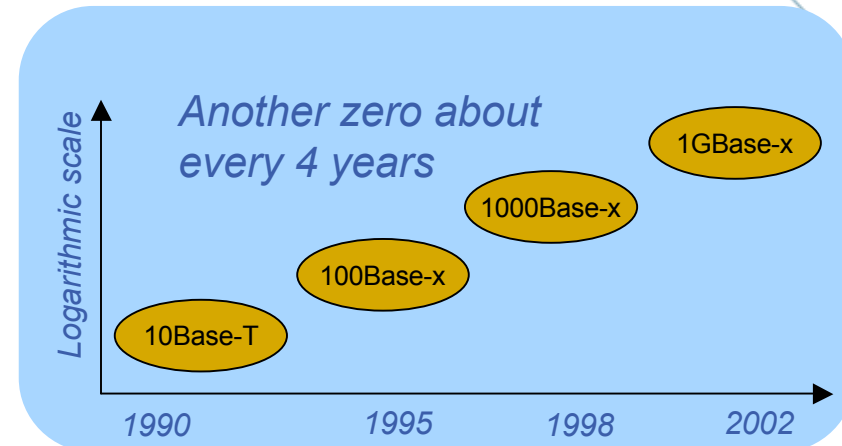
- Cheap/simple -> many -> cheaper -> more -> even cheaper -> ....
- “Universal presence” – fixed network, mobile network, IT systems, consumer electronics, ....
- No one risks loosing out (post “bubble burst”)
- Company consolidations (acquisitions...)
- Networks/systems consolidations
- More services and applications



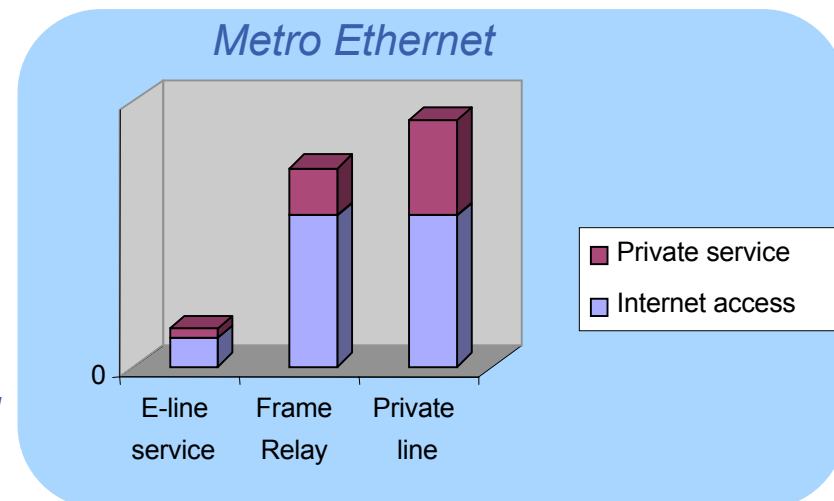
## Why does this happen – examples

### Price trends - Ethernet-related:

- **10 G port (Ethernet):**
    - 2002 (late): ca 20 000 USD
    - 2003: ca 5 000 USD
    - 2004: ca 2 500 USD
    - 2009 – 2010: 200 – 300 USD ?
- {Source: Lightreading.com}



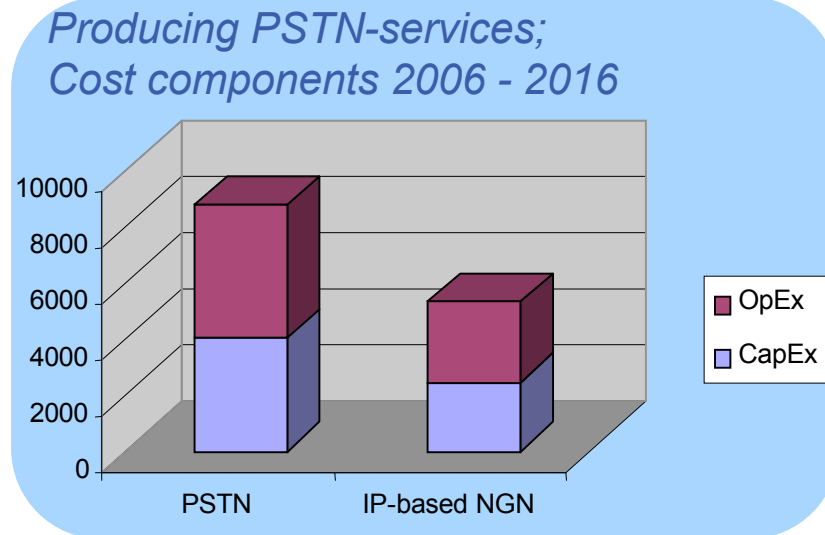
- **Ethernet services gaining from lower prices:**
  - {Source: MetroEthernet Forum, 2003}
  - ..., but services compared are not equivalent!
- **Ethernet-optics vs. TDM-SONET/SDH:**
  - Provider's CapEx savings ca 39 %
  - Provider's OpEx savings ca 49 %
  - {Source: MetroEthernet Forum, 2003}
  - ..., but solutions compared are not equivalent!



## Why does this happen – examples

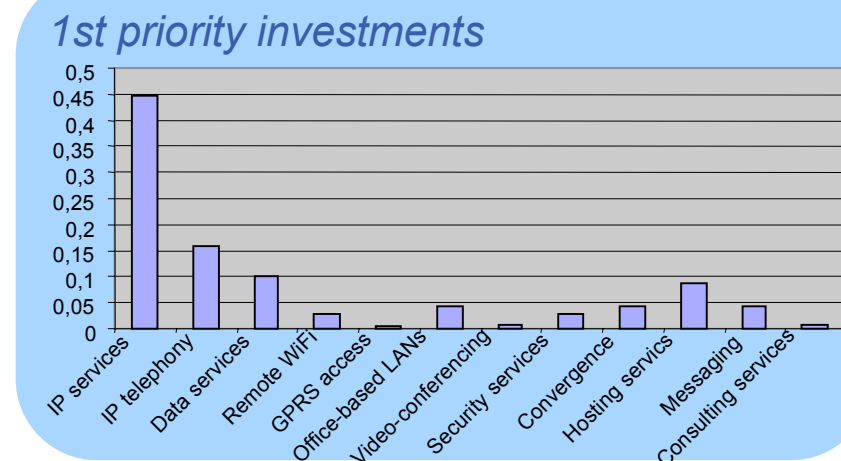
### Price trends - network solutions:

- **Migrating PSTN to IP-based network:**  
Savings in overall CapEx and OpEx  
{Source: Marconi presentation, Nov.2004}



### End user forecasts:

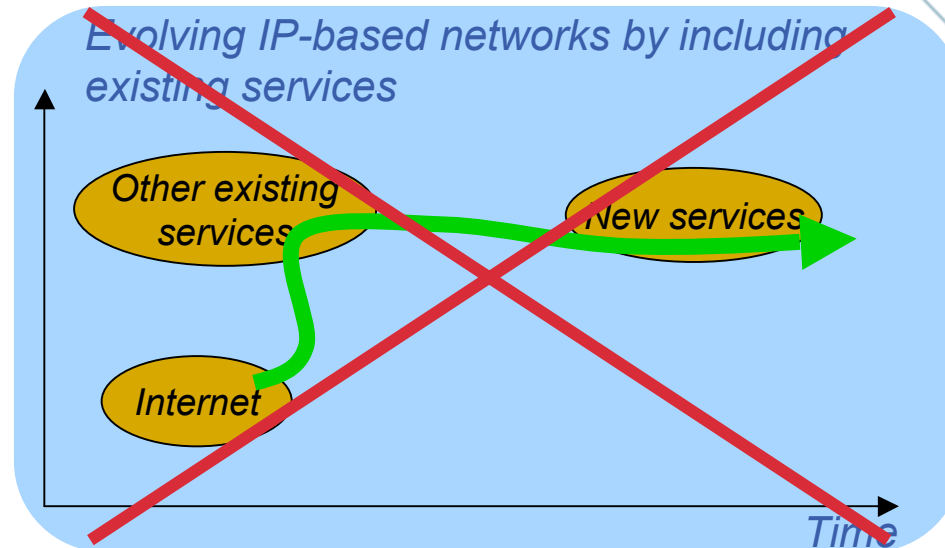
- **Enterprise most important datacoms investments:**  
“... everyone asks for IP-based solutions....”  
{Source: Equant poll presentation, Nov.2004}



# What are the proper steps?

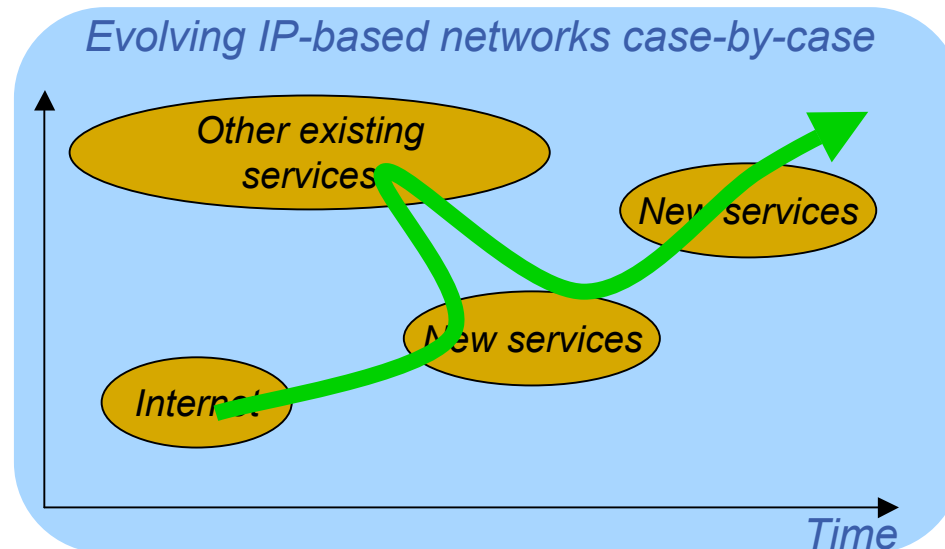
## Some pre “bubble burst” views:

- “IP everywhere”



## Some current views:

- “IP evolving by supporting new services and case-by-case evaluation of existing services”

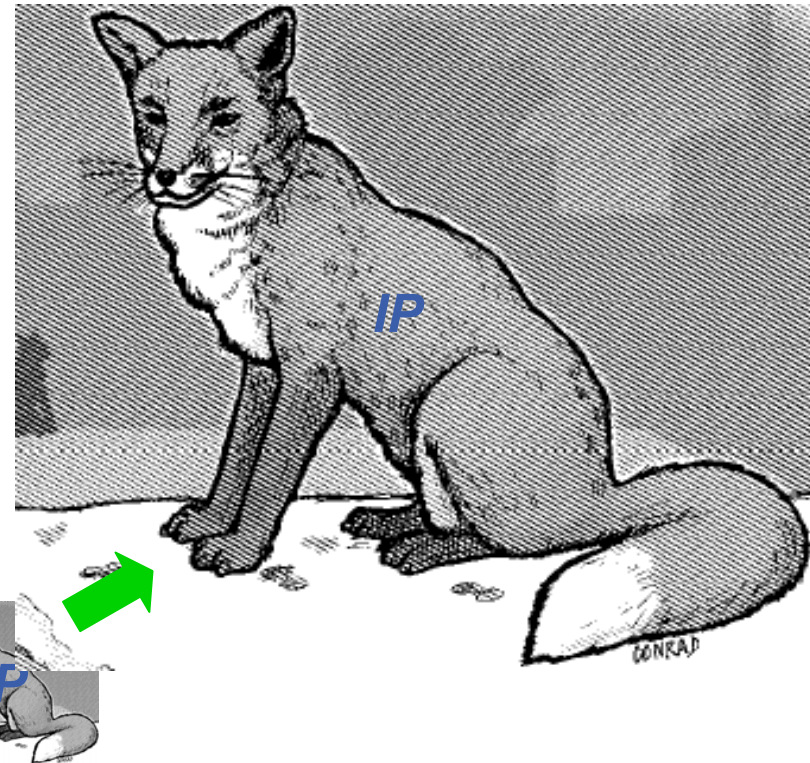


## What are the proper steps? - principle views

- *Back to “IP basics”* → *the “good enough” philosophy*
- *Not IP everywhere at any costs* → *case-by-case decision and timing issue*

### Compared with earlier:

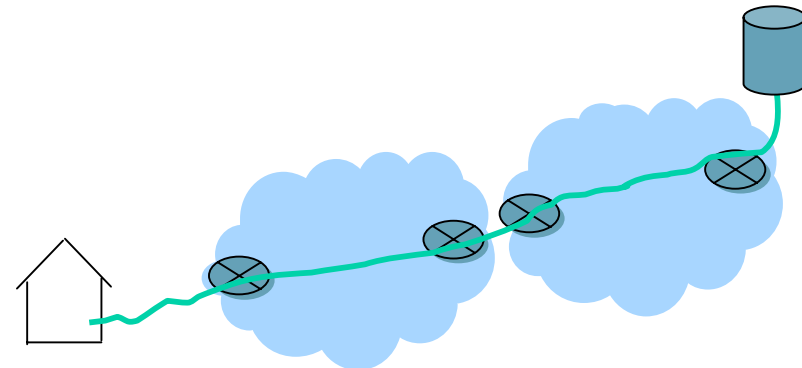
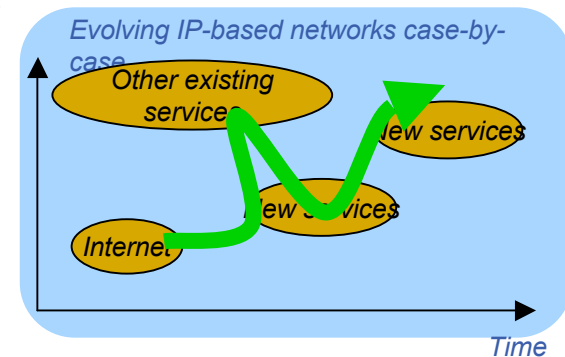
- *More pragmatic*
- *Keep it simple (first)*
- *Do it the right way*
- *Lower threshold (economics and others)*
- *Attention on speed*



# Can IP miss out? Are other solutions better?

## Some technical issues to be addressed:

- **The “best-effort” basics – more features for supporting:**
  - Ensured service levels (and monitoring), end-to-end
  - Differentiation
  - “Circuit-switched imitations”
  - Applications supporting more features
  - Advance routing and naming, identifying “resources”
  - Security!
  
- **Balancing features and efficiency:**
  - Protocol overheads
  - Processing capacity
  - High capacity connections, high bit rate links
  
- **Network view (management)**
  - Logical management view of network resources
  
- **Lack of overall architecture**
  - Who puts the technical pieces together?



## Concluding remarks

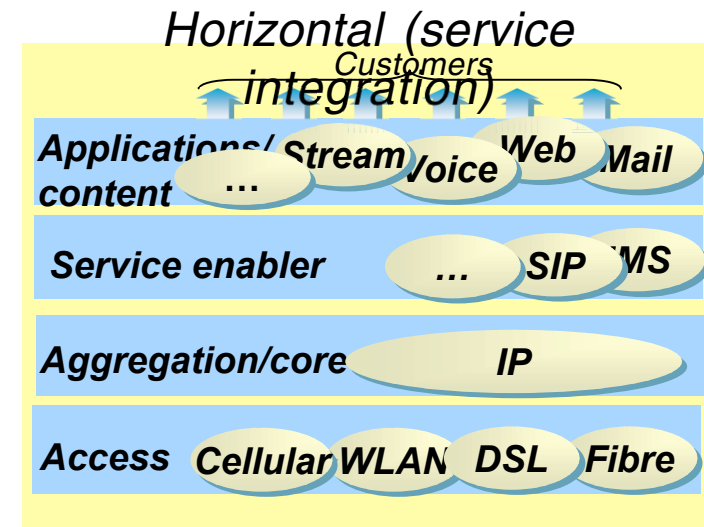
The “IP philosophy”:

*.. simple/good enough – as expected – and cheap...*

- IP feature list grows to support more (and more) services
- Cost patterns evolve to promote IP (and packet)-based network solutions

List grows →

IP works	A	B	C	D
Technical	V	V	V	V
Economics	V	V	V	V
Organisation	V	V	V	V
....	V	V	V	V



”Any service, any terminal, anywhere, anytime, to anyone”:

- Multi-service over same access (bundling)
- Access independent services
- Seamless mobility across accesses and networks
- Automatic provisioning and self-service
- High resource utilisation
- Inter-domain communication with security and quality of service

