Experiences with

Also known as Debian-edu ...

7th of July 2007

By project manager cand.scient Knut Yrvin 3th July 2007

Prevent PC's breaking schools budget

- **Economy**
- **Centralised operation**
- **Digital Competence**

Warning: Some of this is not for nerds

> 450 schools using Skolelinux

Skolelinux 3.0 will most likely be released this mont
We are currently teaming up with LinEx, Extremadur

Skolelinux/Debian-Edu is

- A complete ICT-solution for the schools
  - network architecture out of the box
  - operational concept
  - digital user profile
  - OpenOffice and 75 user programs
- Presented in the pupils' mother tongue with the school's curriculum in mind
- Made for the school budget
- 1-2 hours to install and configure
  - Try that with RedHat or Windows Server

What does others say about Skolelinux

«Skolelinux has taken the plan for using computers in schools seriously. They have made a complete product that is tailored to the pupils' daily work and the resources that schools have»

Statskonsult 2003:24 p28

«Thanks to Skolelinux there is a tailored Linux distribution for schools that is easy to install, update and maintain».

Teleplan, October 2003 p24

«More use of Linux in education can contribute to school children being more flexible, innovative and more competent users of computers».

The Norwegian Technology Board, February 2004

Economical realities

Nittedal municipalities choice in 2001

Since we don't got the money buying new equipment and licenses in our schools, we will stay with Windows 98 until 2008.

After introducing Skolelinux in 2002, we now got money to buy newer hardware for money we otherwise needed on Microsoft licenses.

Huge differences

- **Nittedal municipalities supports 400 office PC's and 400 users with 6 employees. They pay 50.600 Euro for Microsoft licences annually**
- **“Central” operator cost for each PC is 791 Euro a year**
- **At 10 primary schools they got 506 PC's with Skolelinux and 3200 users. Systems are maintained centrally with one operator on half time (2 ½ days a week).**
- **Operational cost for each PC is 100 Euro a year**
- **In addition each school got an local ICT-contact with 1-4 hours a week doing “helpdesk” support. The municipality also got a pedagogic coordinator on half time. Totally they got 1½ man-year to support 3200 users and 506 client PC's. That's 37 Euro each user**
- **The regional hospital paid 1.500 Euro a year to the City Council at Akershus to operate a standard office PC in 2001 (ref: the contract)**

The municipality uses 5 times more on computer maintenance for each PC

Many principles have to choose between hardware or people. Most of the schools must pay expenses that compares to one or two teacher positions, the headmaster says ...

Aftenposten

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PC'ene knekker skolebudsjettene

Nedbemanning og kutt er fasit for mange skoler etter at budsjettene er vedtatt. Verst går det ut over skolene som nå overtar regningen for drift av elevenes skoledatamaskiner.

HANNE W. LIER

Nå roper lærerne, rektorene og skoledirektør Astrid Søgnen et varsku. Alle mener at manglende penger til drift av de nye IT-systemene skaper store problemer for de 59 IT-skolene.

- Generelt er det alltid noen nedskjæringer i Oslo-skolene, men i år har vi i tillegg et stort systemproblem: IT-skolene får driftsutgifter langt utover det de hadde regnet med, sier Anne Lorange, leder for Oslo-rektorene i Utdanningsforbundet. - Mange rektorer er i ferd med å måtte velge mellom maskiner og mennesker. For de fleste skolene er det snakk om utgifter som tilsvarer én eller to lærerstillinger, sier hun.

Tomt for penger. Datatrøbbel. Nordberg ungdomsskole har ikke penger til IT-satsingen som skoleetaten står for. Driftsleder Morten Biong Nilsen og sønnen Andreas Eskeland (14) fortviler.

FOTO: OLAV HASSELKNIPPE

FAKTA

Disse skolene sliter med ekstra datautgifter:

Barneskoler

Ammerud, Bestum, Ekeberg, Kjelsås, Lilleaker, Lilleborg, Ljan, Lusetjern, Manglerud, Nedre Bekkelaget, Sagene,

Bandwidth, equipment, and placement

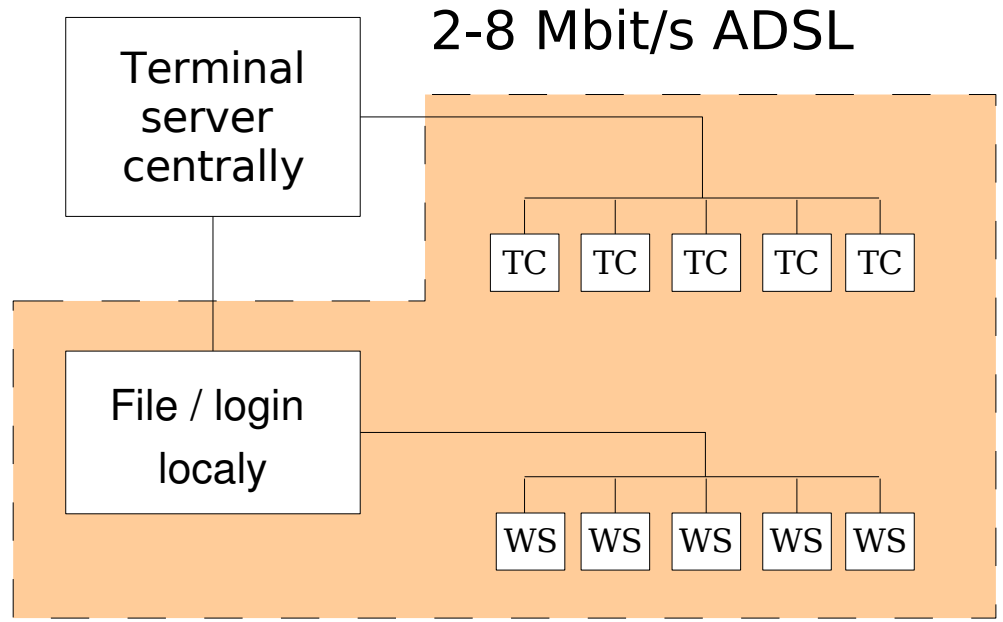
Attempt on fixing the «traditional» PC architecture from the 1990s

Graphical FreeNX or Citrix clients?

- Full software install locally on client – including distribution
- Must add a graphical terminal
- User application are run centrally and locally
- Duplication of maintenance
- Limitation when distributing multimedia

Programs run both centrally and locally

Centralised operation with FreeNX



> 100 client machines

TC =Thin Client
WS = Workstation

- No support for media rich applications. National exams with Flash has to be done on workstations
- To ensure local storage and Internet you need two structures for saving files and support services
- Increased need for bandwidth. Less use of reused computers

«Double» structures for running user applications

~240 EURO annually to operate every PC

Real thin client with X

- Old PC's (133-233 MHz) without local harddisc
- All applications are run on server(s)
- Clients just handle keyboard and graphics
- No local administration!

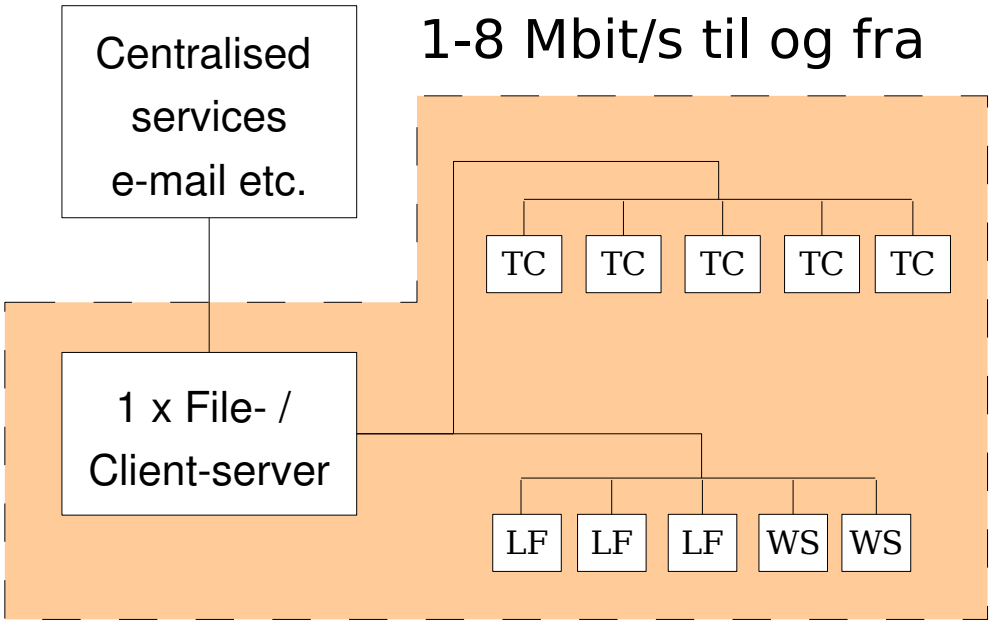
All the programs are maintained centrally

Low fat client

- Newer reused computers with >800 MHz and 256 MB RAM. Local or central swap (Linux likes swap)
- Clients runs everything! video, usb pen, DVD, heavy Java and Flash things etc.
- As little administration as the thin clients!

Programs runs locally centrally maintained

Centralised operation with Skolelinux



> 100 client machines

TC = Thin Client
WS = Workstation
LF = Low Fat Client

- Full support of media rich applications and net based exams with thin clients
- Runs thin clients (w/o hard disk), laptops, low fat clients, workstations etc.
- Reduced demands for bandwidth Full reuse of older hardware from 1998 and newer

Simple structure for running user applications

~115 EURO annually to operate every PC

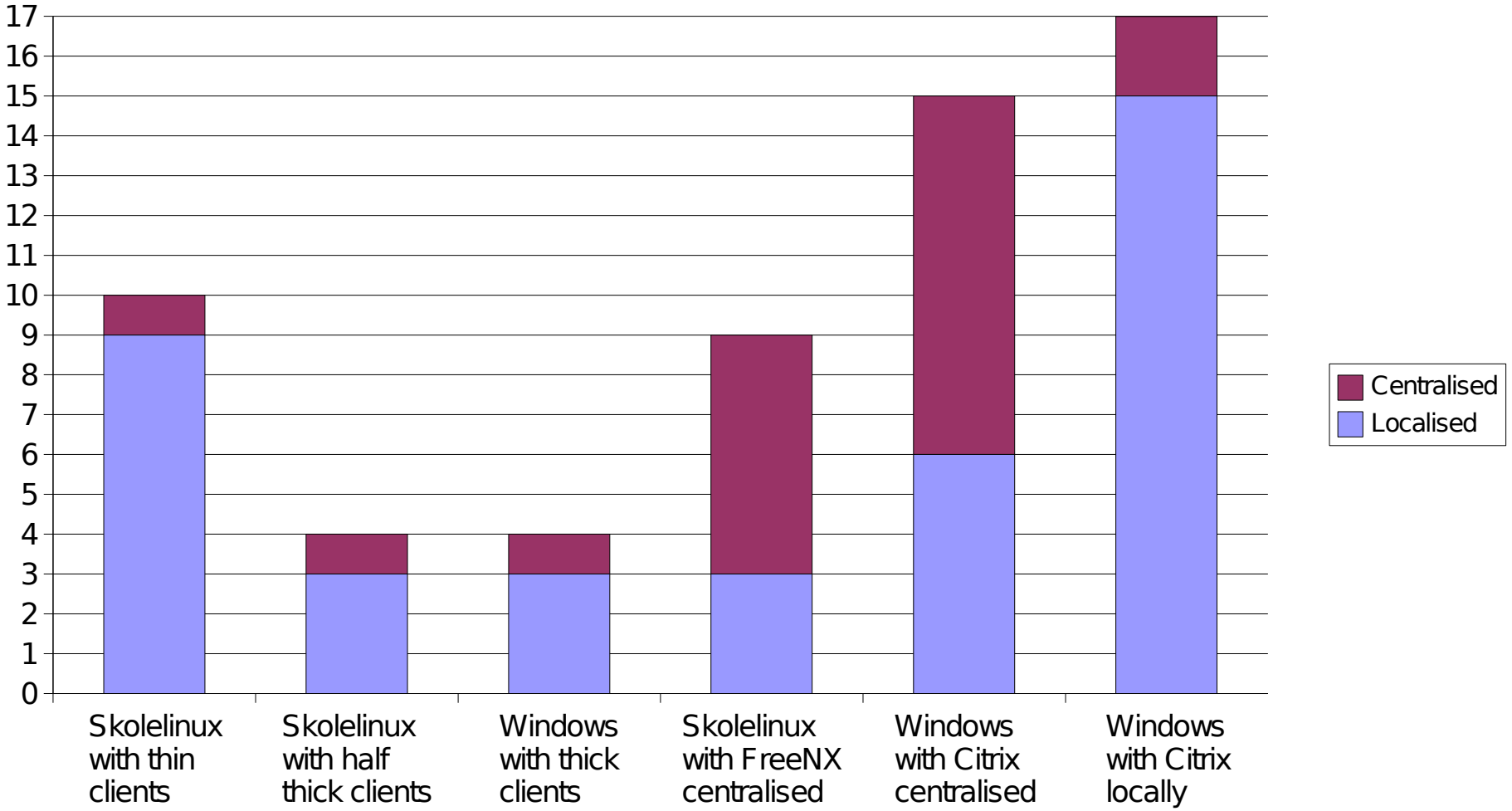
Servers, bandwidth and clients

Type	Skolelinux with thin clients	Skolelinux with half thick clients	Skolelinux with FreeNX centralised	Windows with Citrix centralised	Windows with Citrix locally
Local servers	9	3	3	6	15
Centralised servers	1	1	6	9*	2
Bandwidth if centralising the client servers	High (low-middle when using locally placed servers)	Low - middle	Low - middle	Low - middle	Low - middle
Pro	Rady for ICT-based exams. Full reuse of old PC's with 133 MHz CPU	Rady for ICT-based exams. Reuse of old PC's with 450 MHz CPU. Better utilisation of the bandwidth. Removes the need for thin client servers	Can reduce the thin client servers to 60%. Not every user uses the client in the same time.	Can reduce the thin client servers to 60%. Can use Linux-based Citrix client (TNT)	Can use older PC's with Linux based Citrix clients (TNT)
Con	More servers. Could trigger high expenses when hiring broadband.	Half thick clients should have more CPU than 450 MHz.	Need for two structures for software deplpyment (3 Bandwidth stops ICT-based exams	Need for two structures for software deplpyment (3 Bandwidth stops ICT-based exams	More servers (and even more than Skolelinux with LTSP)
Running programs	Locally	Locally	Locally and centralised	Locally and centralised	Locally

3 schools, 400 users and 150 clients at every school

*** Advantage: use of max. 60% of the thin clients at same**

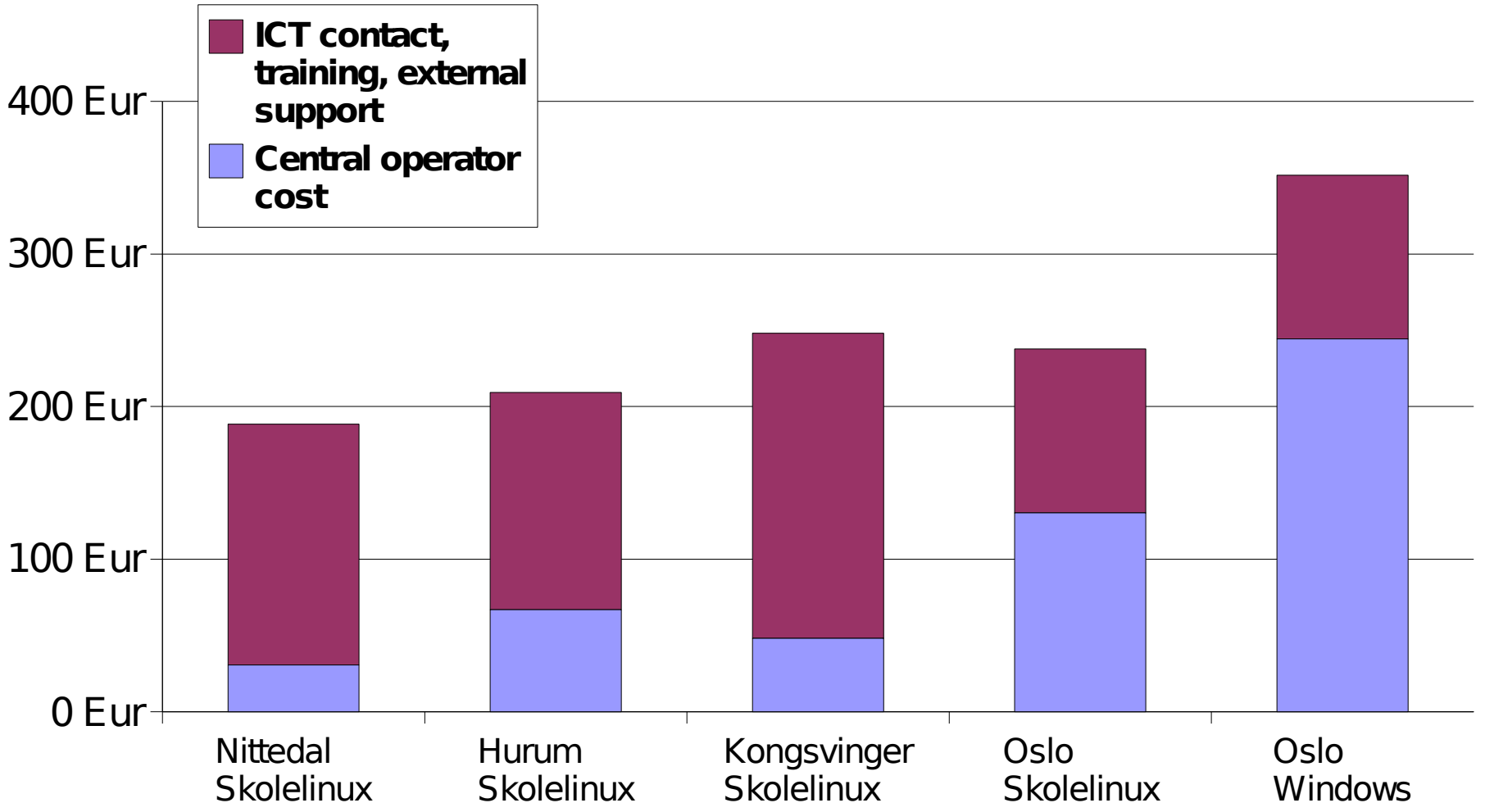
The number of servers



3 schools. 150 clients and 400 users at every school

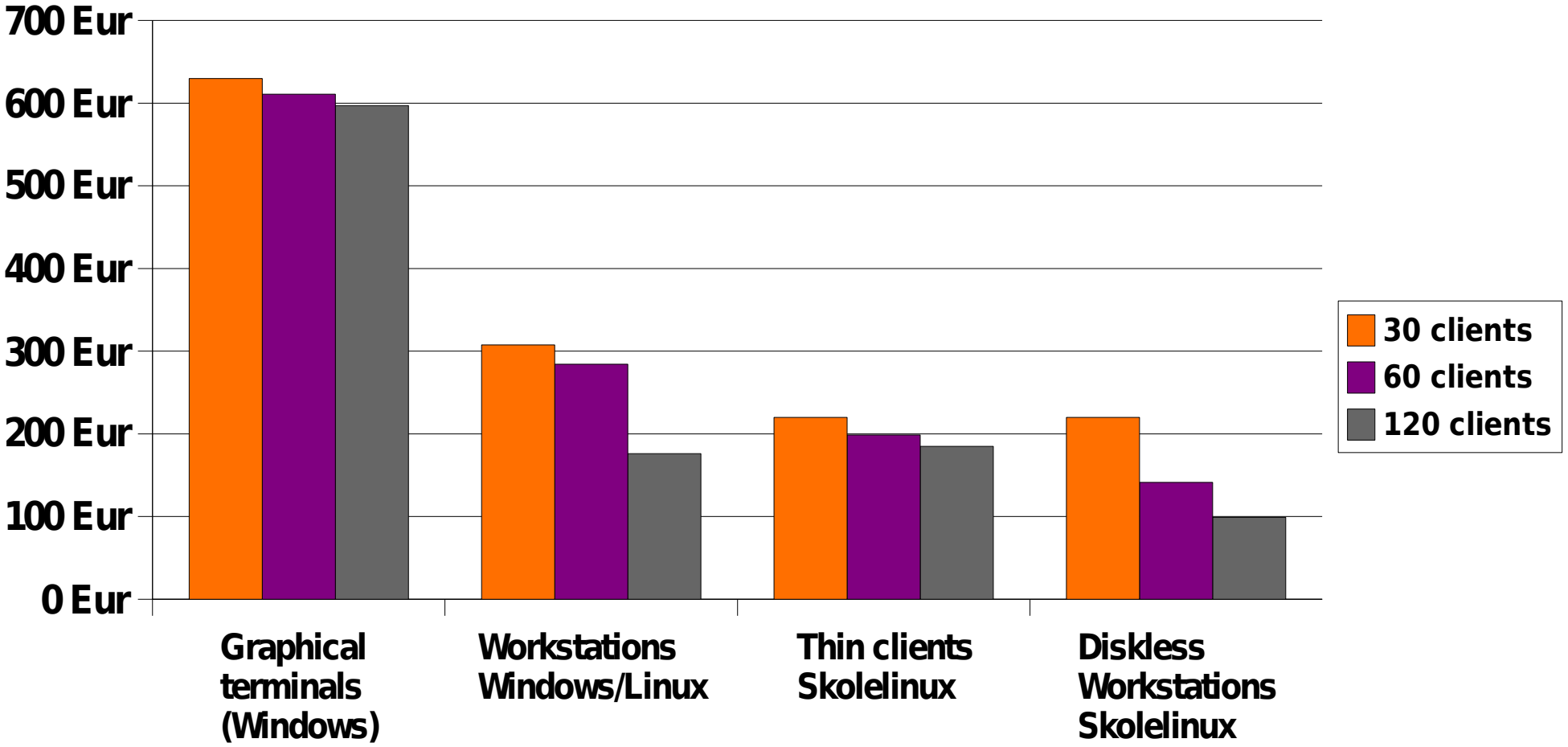
* FreeNX or Citrix have limitations on supporting media rich app

Running cost each PC 2008



Ref: Municipality of Oslo, Hurum, Kongsvinger and Nittedal

Market prices annually



w fat client (diskless) got half the operation
st compared to any other client alternative
s including central operation and hardware and excluding local ICT-co

What does this tells us?

- Other suppliers have to cut the amount of clients or reduce the cost of operation to match Skolelinux. Why pay more to get less?
- The money used in the municipalities is hard to get. Less money you apply for compared to more expensive solutions, more do you increase your chance to get a grant. That's because a less expensive ICT-effort does less damage on the budget

A little about ICT use in schools

Values

Do you take the drivers licence you learn to travel safe with constant change in the traffic

To drive the teachers BMW as fast as possible is not the idea

The traffic picture changes constantly

That's why the pupils needs to understand the road signs at the information highway

The traffic signs has to be in our native language

Master thesis by Åse Bratthammer

- Do you want to learn math, you have to work with it. You need to drill. Then it is no help to make hundreds of Power Point presentations of the theory.
- Not all ICT is bad ICT. We have to be selective.
- The Schools has to use the advantages. Everybody knows the “advantages” with a word processor. That's obvious. There are simulations and animations that could be a great value for the single pupil, but it must not take all the time.

Kilde:
http://www.bt.no/lokalt/hordaland/article336051

Warnings when starting up

- Make a realistic user participated plan
- Make realistic budgets. When using to little money you do not reach your goals
- Increase your procurement skills
- Collect experience reports from the web
- Buy equipment where everything is put together and tested, both reused and new
- Think centralised operation
- It's a big difference on a deployment plan of hardware, and pedagogic use of computer programs

Conclusions

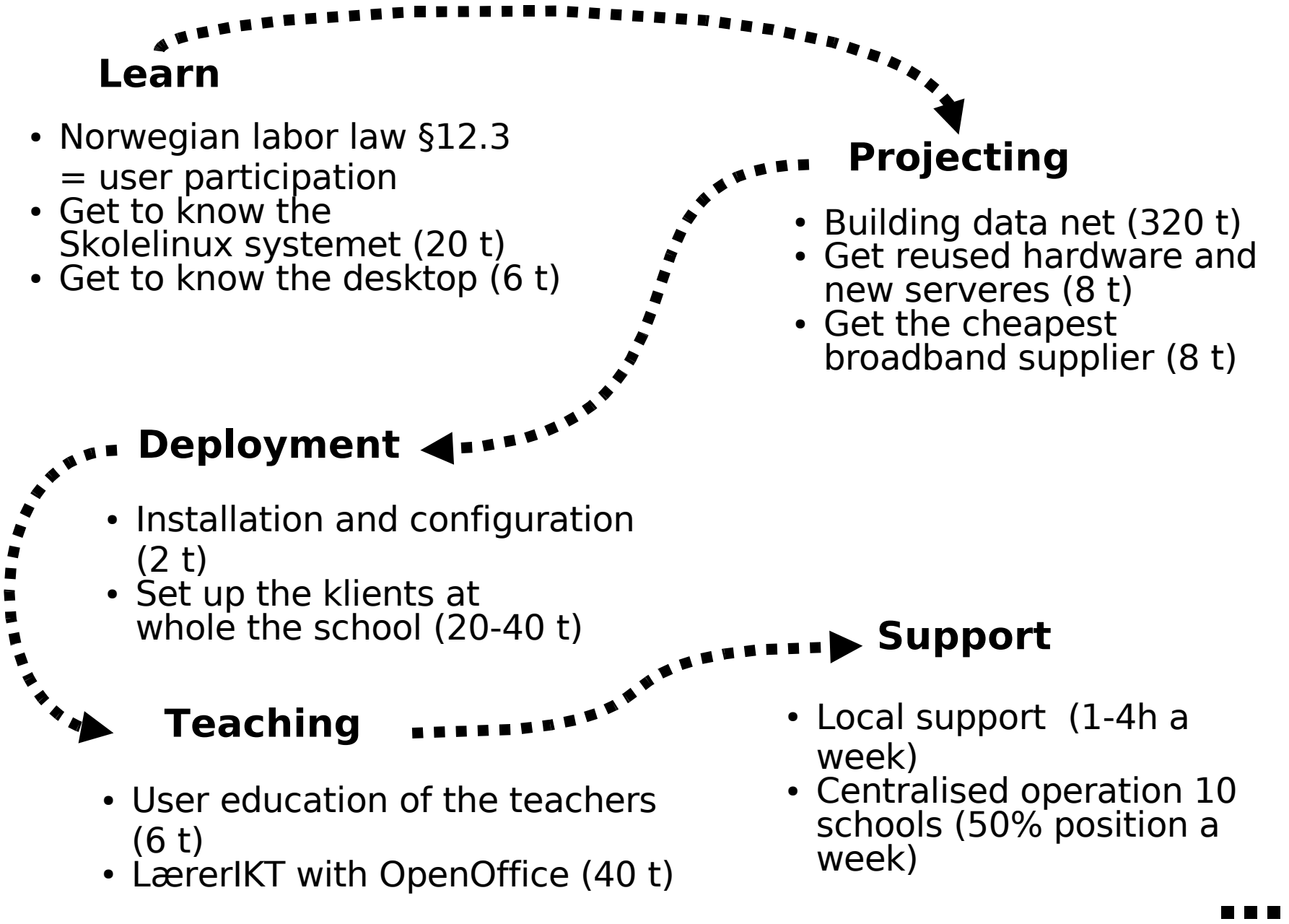
- **The suppliers have heavy interest in the solutions they recommend to the schools**
- **Functionality of the user applications depends strongly on where the hardware is placed**
- **The most important factor is to educate the teachers in use of ICT**

Improvements in KDE?

- **School desktop profile (sugar-ifisation?)**
  - **Tailor it to lower grades and upper grades. Pupils got different needs on different levels**
- **Make the desktop more beautiful and fun**
  - **full multimedia support, plugins, icons**
- **Reduce system requirement with KDE**
  - **KDE already outperforms GNOME by a**

Questions?

Skolelinux deployment



User friendly

“The usability threshold with Skolelinux is relatively low, and lower than when we went from win 3x to win 95”

ICT-contakt Frode Stiansen at Birkenlund primary school

“I have been surprised about how easy it was to learn Skolelinux. I believe it would not be difficult to get the rest of my colleges to use the system”

ICT-contact Marit Strømsøe at Holumskogen primary school