Linux Terminal Serve Project (LTSP)

An Emerging Cheapest Open Source Client / Server Architecture for Business

Abubakar

Email: abubakar@expsys.net

Web: http://www.bakars.com

About this Session

- Introduction to LTSP
- How does LTSP work?
- Why LTSP
  - Security
  - Cost
  - Administration
- A few case studies
  - Government
  - Private / Govt. Funded
  - Bank
- Deployment Paradigms
  - Server Centric
  - Data Centric
  - Data and Application Centric

LTSP: Introduction

- Provides a simple way of utilizing low cost workstations as either graphical or character based terminals.
- The processing and memory load can either be assigned to the “low cost workstations” or can be shared from LTSP server.

… Continued

- Thin Client?
  - A diskless workstation
    - Minimum 100 MHz Processor
    - 32 MB RAM
    - PXE enabled NIC
    - VGA card
- How to setup?
  - Install LTSP on a certain Linux flavor
  - Boot the thin client

Behind The Scene on Thin client

- Linux kernel along with a ram-disk image into memory, using Boot-Rom or floppy, is loaded
- A small *dhclient* will then run to assign IP to the thin client
- Filesystem via NFS is mounted
- *Init* sets workstation environment by reading */etc/inittab*
- *And so on*

Why LTSP?

- Traditional offices have relatively high powered workstations.
  - Office productivity suit
  - Internet browsing
  - Customized applications

- Investment on a single workstation is higher, when compared to the performance required to carry out office routines.

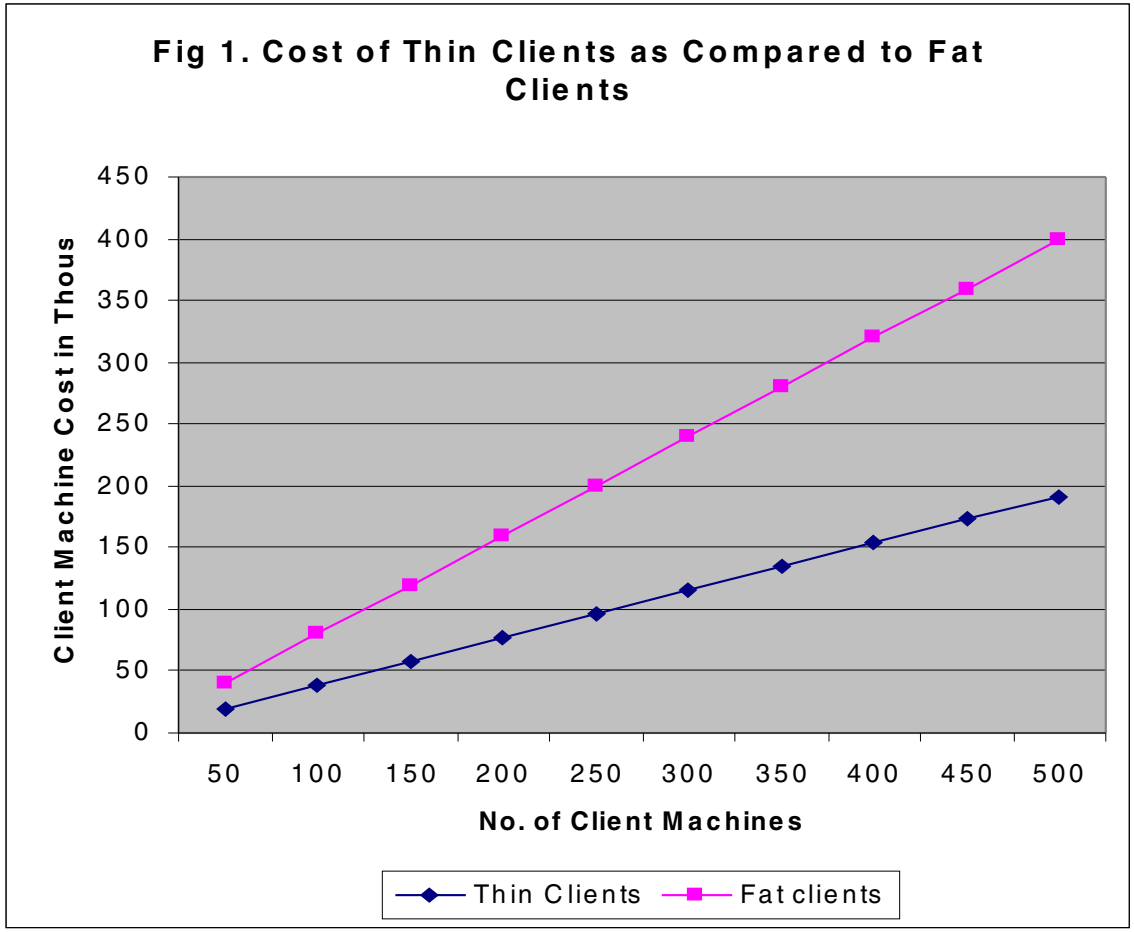
…continued

- It’s the following that matter
  - Cost
  - Security
  - Ease of Administration

Cost

- A workstation + windows XP costs $799 ($500 + $299); 50 nodes calls for $39950.00

- A thin client for LTSP costs $383.333; 50 nodes calls for $19167.00

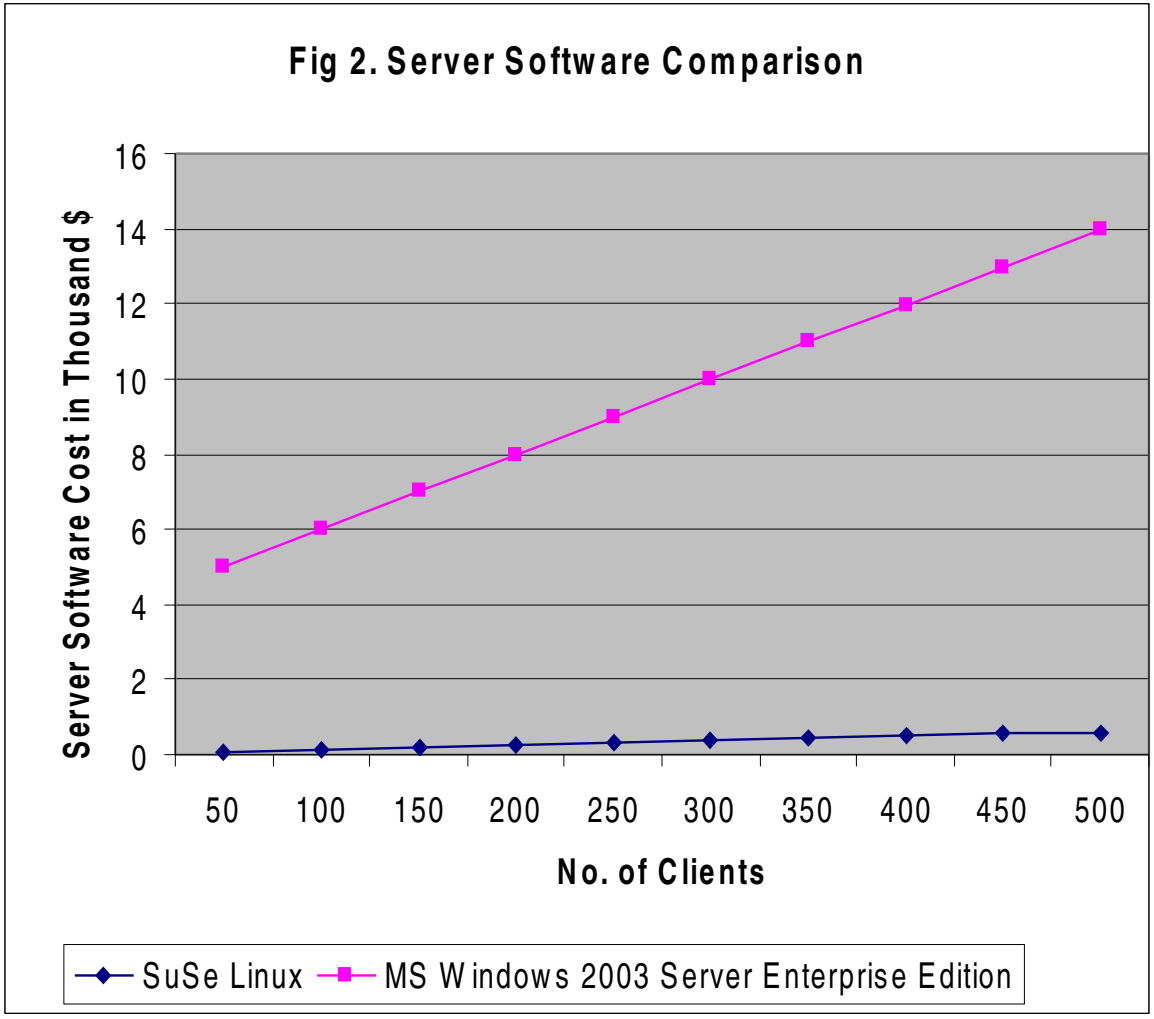


… Continued

- $59 for a single SuSe Linux, that shall support 50 thin clients.

- $4997 for MS Windows 2003 Server EE, with 50 CALs[1]
  - $998 for another 50 CALs pack and so on

•Note: Both Microsoft and SuSe offers special rates on volume licensing/procurement



[1] http://www.microsoft.com/windowsserver2003/howtobuy/licensing/pricing.mspx

Security

- Linux has inherited security of UNIX
- A survey, in 2004, by Evans Data Corporation, California, US.
  - 92% of Linux systems have never been infected by a virus
  - 80% of Linux systems have never been hacked
- Reduces cost of physical damage
- Beside that, your data is centralized.

Administration Ease

- Single point of administration
  - Upgrades
  - Add remove applications
  - Data storage
- Reduces risk of

Case Study

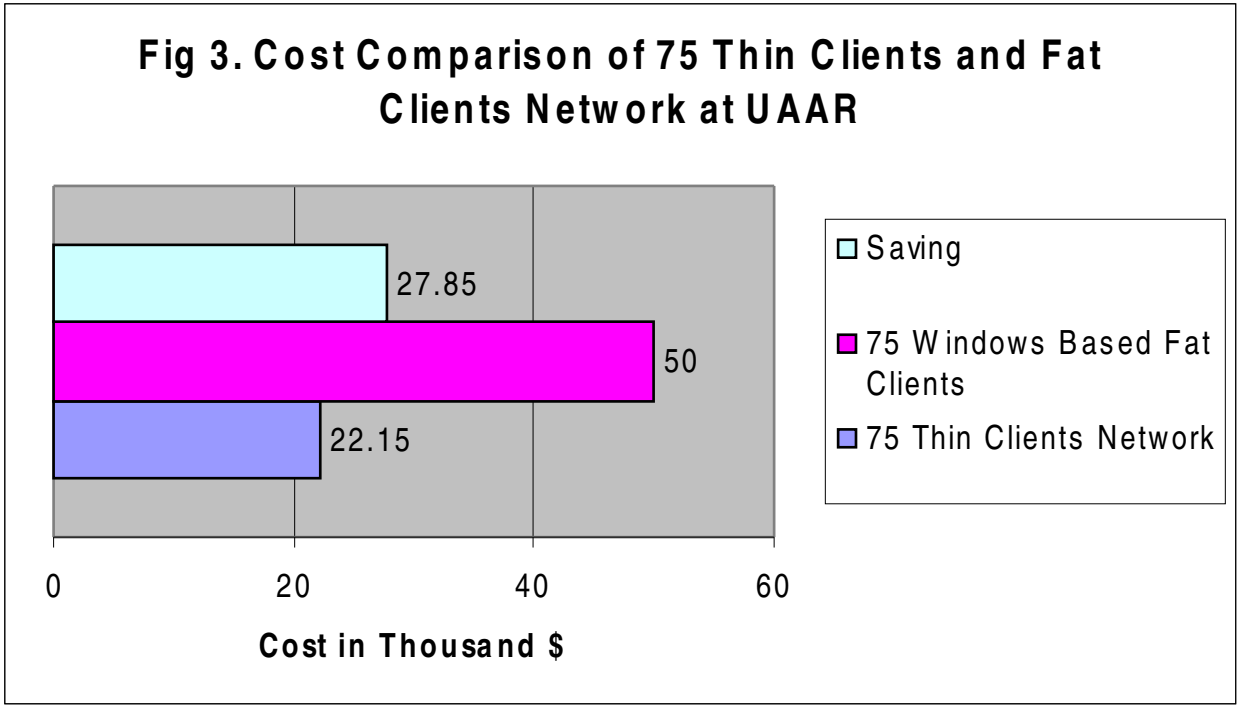


Fig 3. Cost Comparison of 75 Thin Clients and Fat Clients Network at UAAR
27.85
50
22.15
0
20
40
60
Cost in Thousand $
Saving
75 Windows Based Fat Clients
75 Thin Clients Network

… Continued

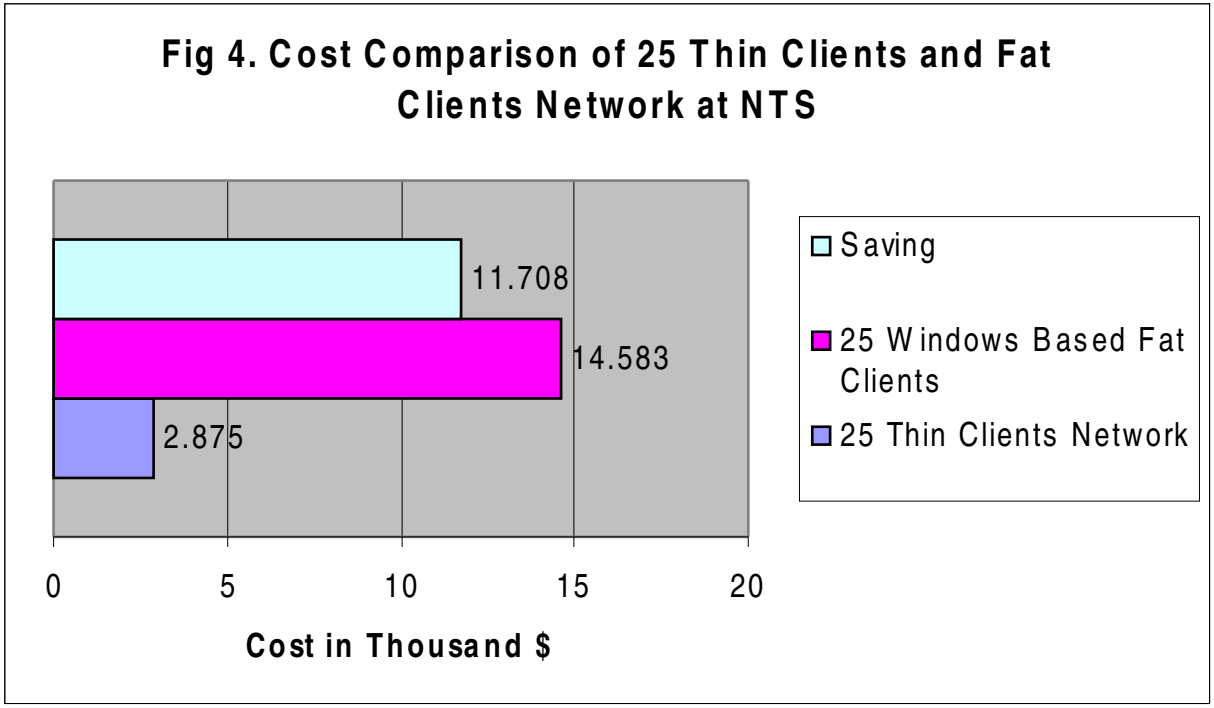


Fig 4. Cost Comparison of 25 Thin Clients and Fat Clients Network at NTS
11.708
14.583
2.875
0
5
10
15
20
Cost in Thousand $
Saving
25 Windows Based Fat Clients
25 Thin Clients Network

… Continued

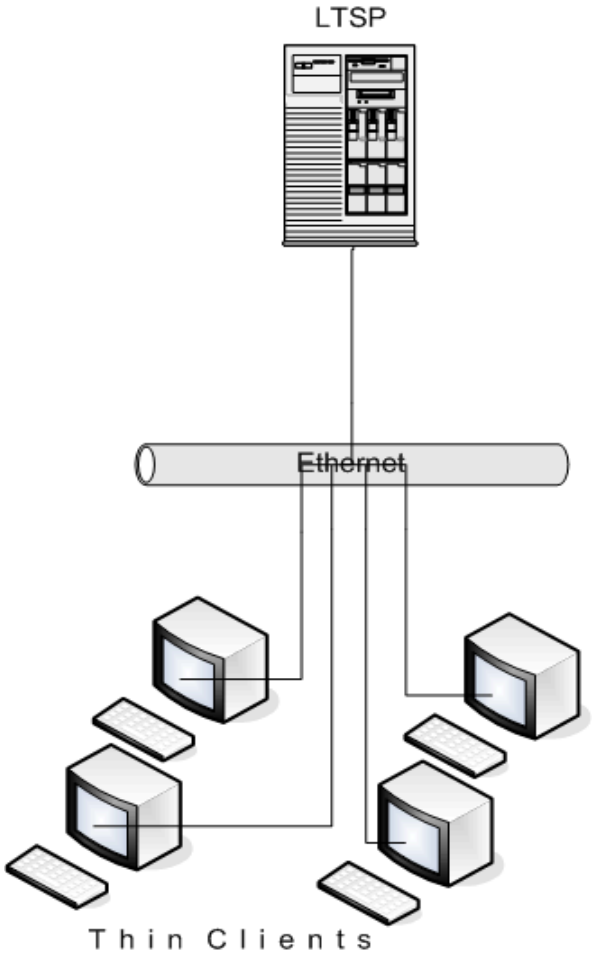
- **Bank Al-Islami**, in Pakistan, are going end-to-end Linux
- Above 50% saving in 75 nodes deployment.
- Future expansion comprise of 300 nodes in more then 4 cities

Deployment Paradigms

- LTSP can be deployed in several ways, depending upon
  - No. of clients
  - Concern about security
  - Management
  - Data storage

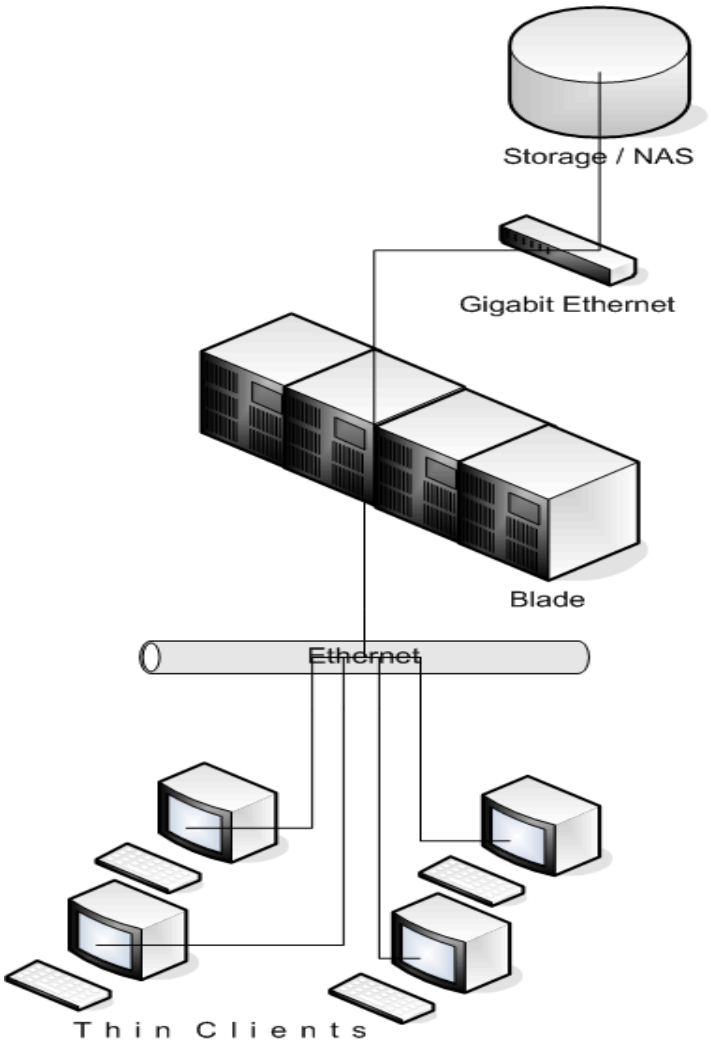
Server Centric Deployment

- One or more LTSP servers serve the clients.



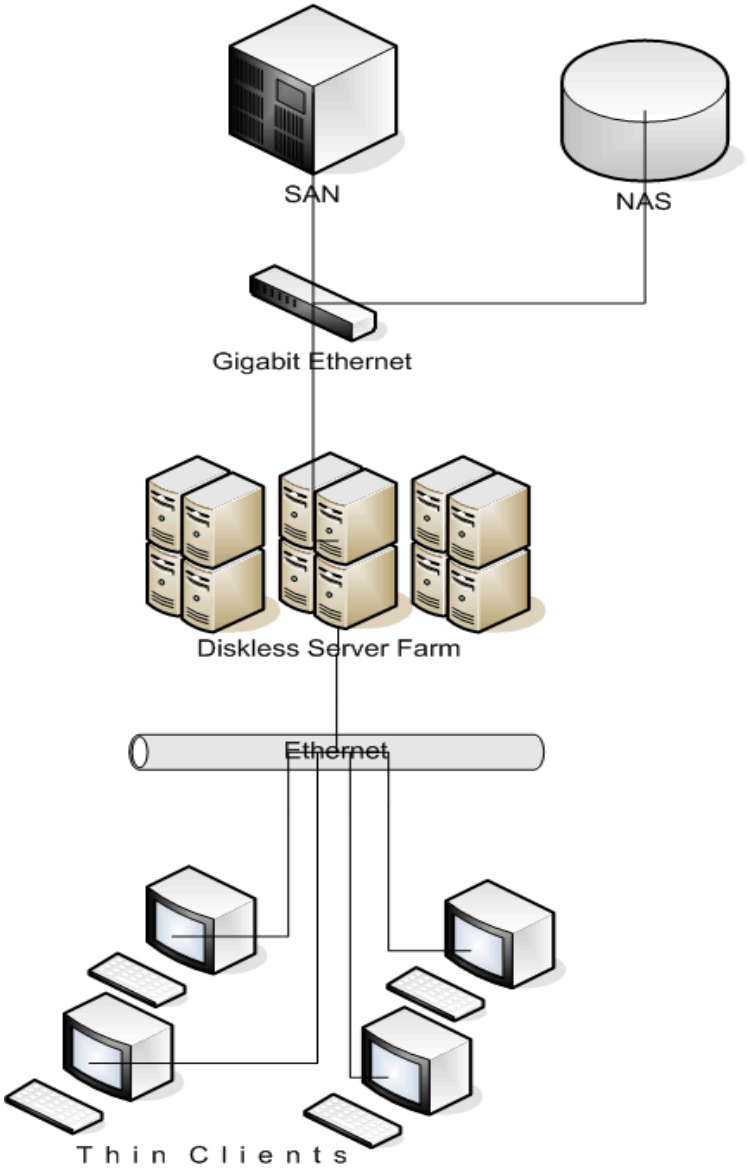
Data Centric Deployment

- LTSP is configured on blades.
- Home directories are mapped on Network Area Storage (NAS)



Application and Data Centric Deployment

- Diskless Server Farm serves the clients
- Storage Area Network (SAN) is partitioned, one partition for each server
- Installation, system or software upgrade is performed on one partition and replicated to others
- Home directories are mapped on NAS



Concluding …

- LTSP should be deployed only where workstations are used for office routines.
- LTSP Provides a relatively cheaper, secure and robust client-server model.
- Deployment paradigms can be opted and customized by small to large organizations

Questions