

IT ARCHITECTURE

SERVER ARCHITECTURES

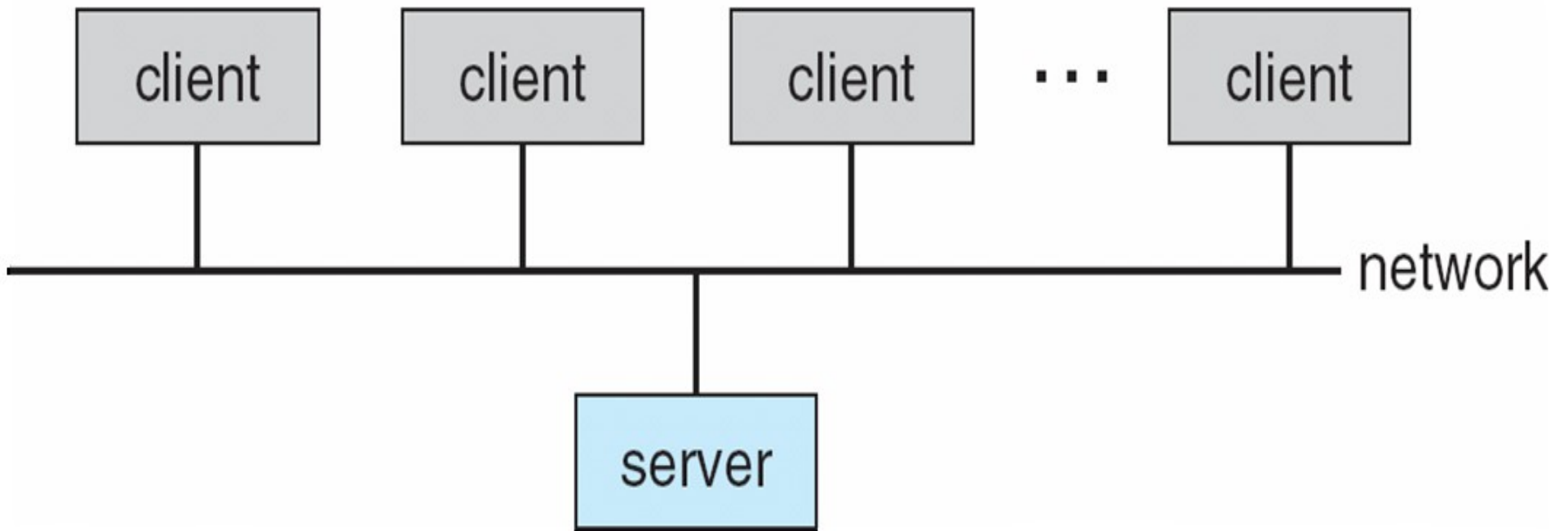
Willy Sudiarto Raharjo

Teknik Informatika
Universitas Kristen Duta Wacana

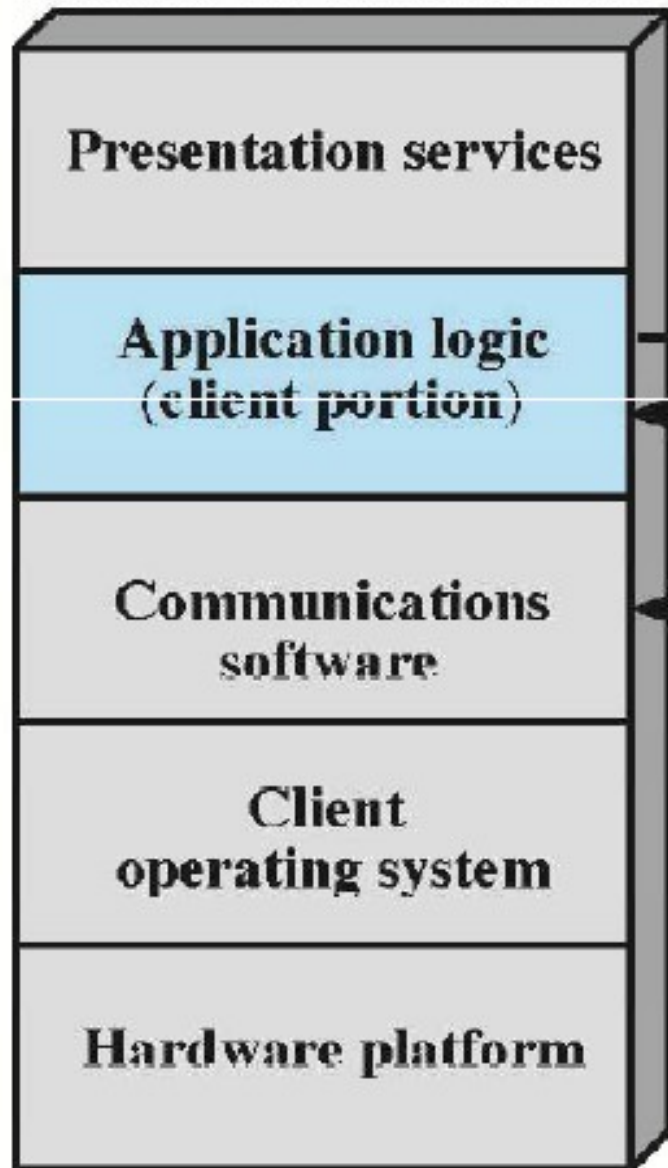
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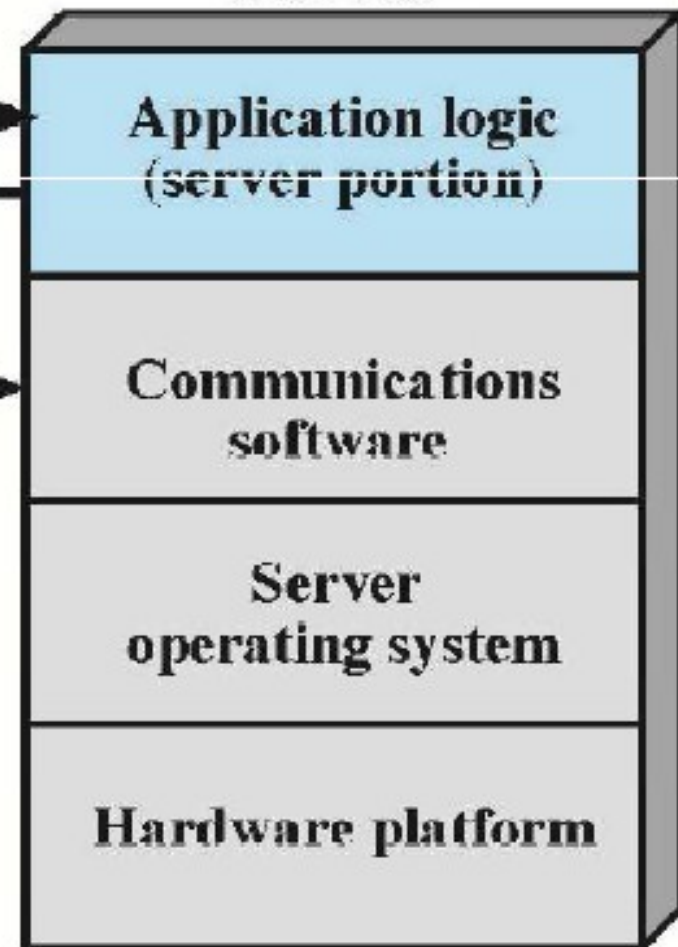
Client / Server



Client Workstation



Server



request

response

protocol
interaction

Client / Server

- Advantages
 - Simple
 - Easy to design/maintain
 - Commonly used
 - Data consistency
- Disadvantages
 - Single point of failure
 - Bottleneck on servers

Client / Server

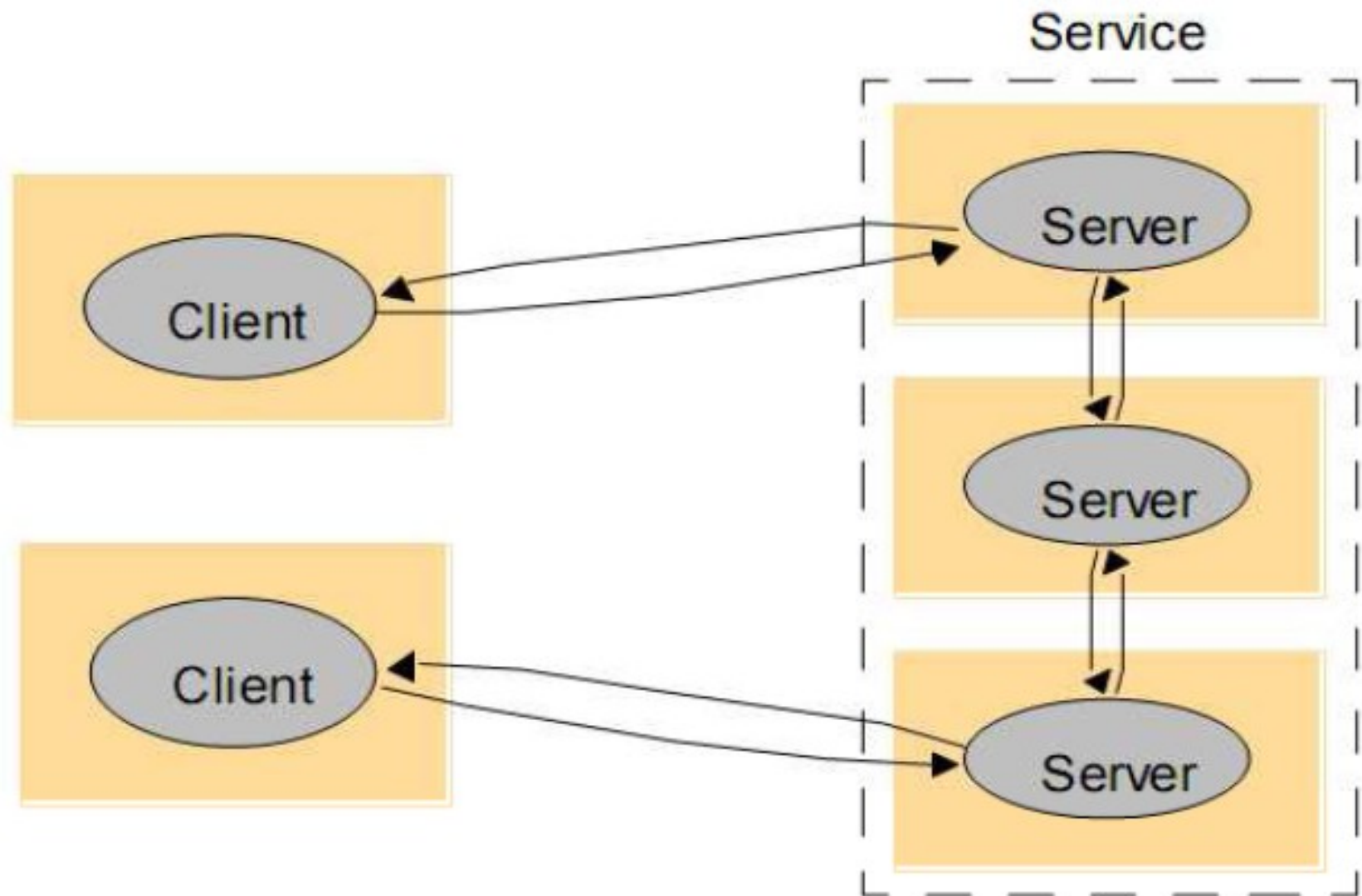
- Server examples

- Web Server
- Mail Server
- DNS Server
- FTP Server
- Application Server
- Database Server
- File Server
- Terminal Server

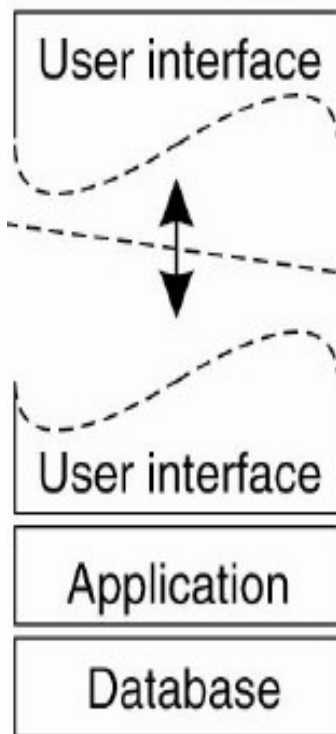
- Client examples

- Browsers
- Email clients
- FTP clients
- Online chat clients
- Database clients
- Dumb terminal

Client / Server



Thin Client



User interface

User interface

Application

Database

Application

Database

Client machine

User interface

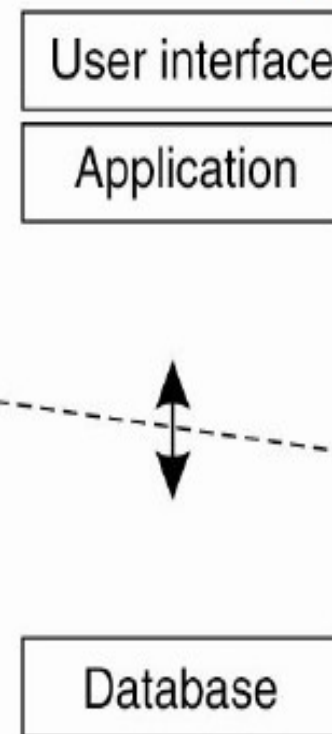
Application

Application

Database

Server machine

Thick Client



User interface

Application

Database

User interface

Application

Database

Database

Thin Client

- Introduced by Oracle in 1993
- Depends heavily on servers
- Low-cost for clients
- Focuses on presentation layers
- Portable clients
- Protocols used
 - VNC
 - NFS
 - Secure Shell
 - RDP
 - X11



Presentation tier

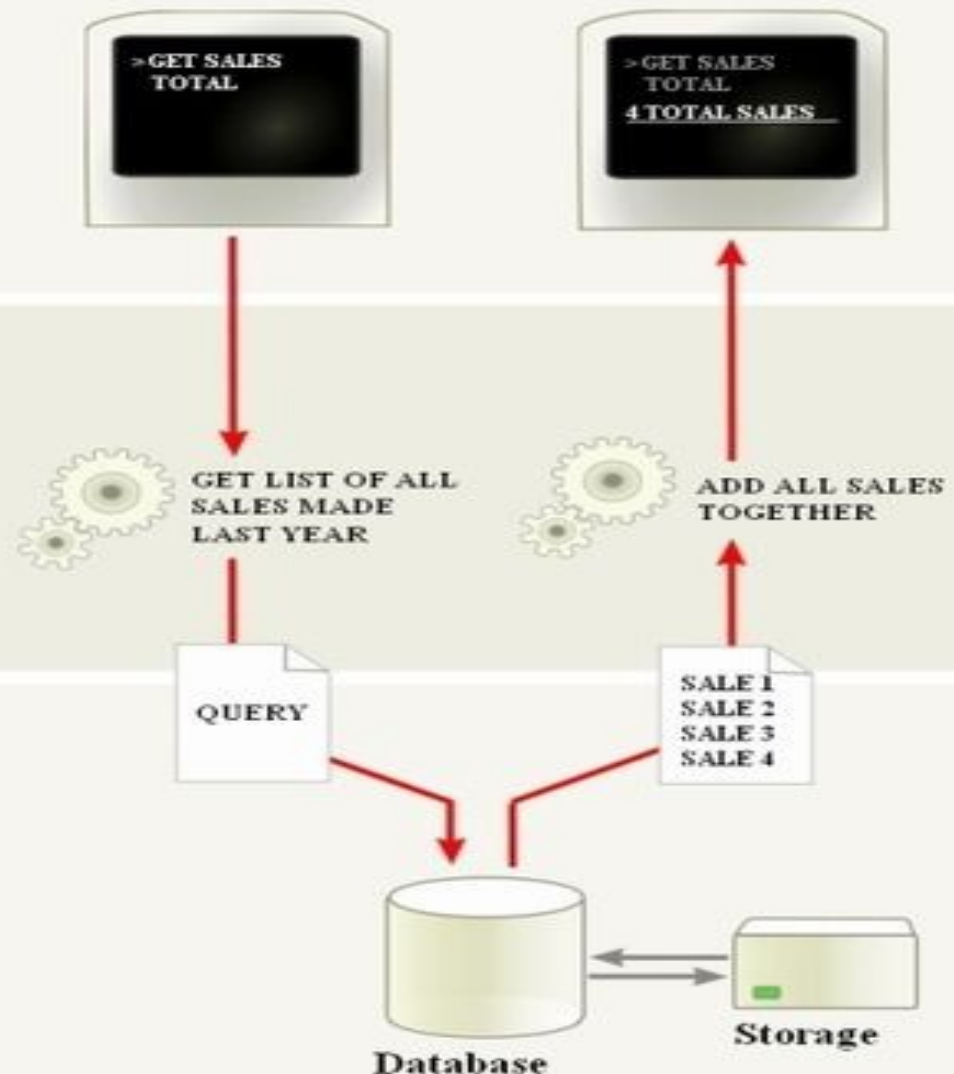
The top-most level of the application is the user interface. The main function of the interface is to translate tasks and results to something the user can understand.

Logic tier

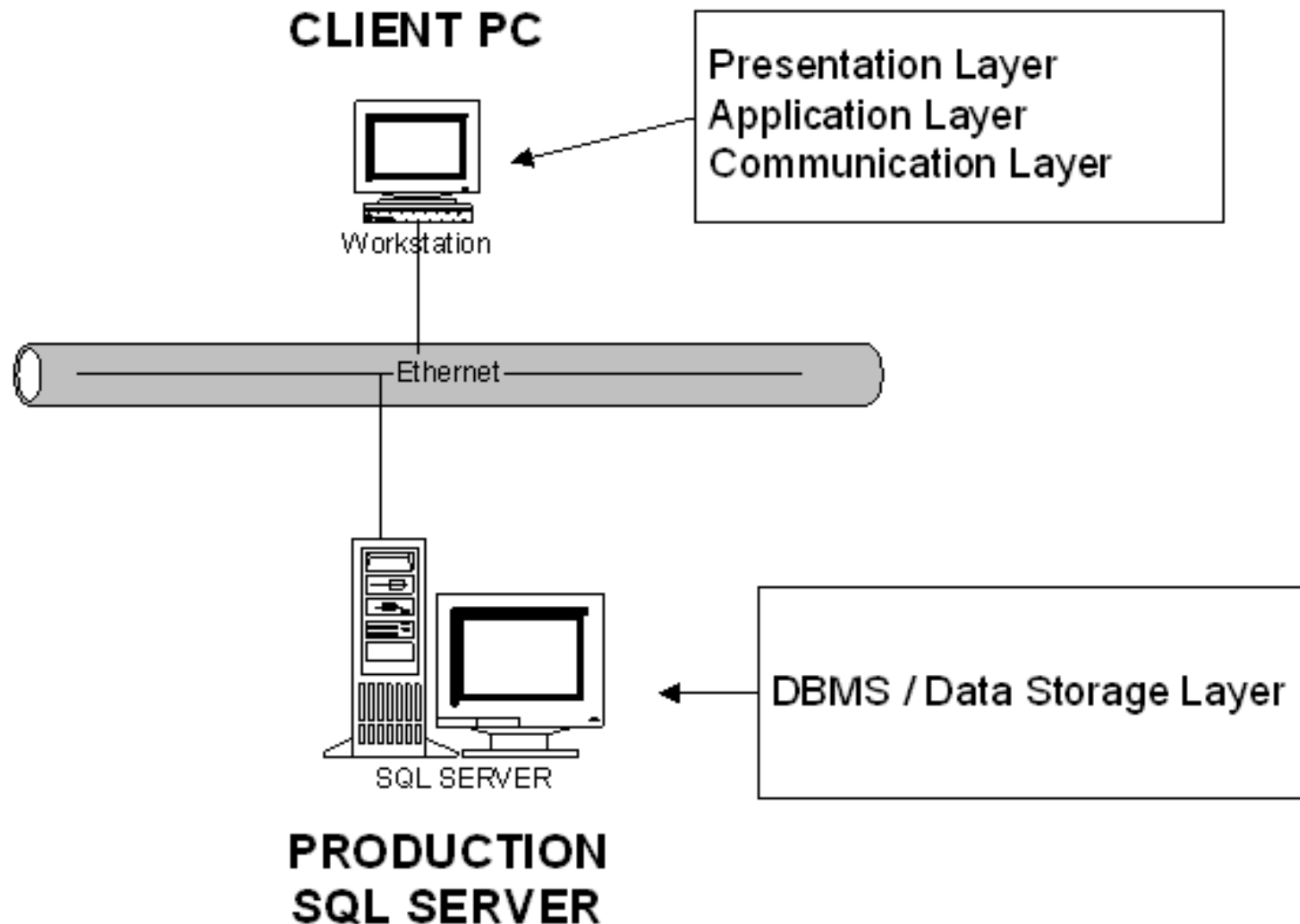
This layer coordinates the application, processes commands, makes logical decisions and evaluations, and performs calculations. It also moves and processes data between the two surrounding layers.

Data tier

Here information is stored and retrieved from a database or file system. The information is then passed back to the logic tier for processing, and then eventually back to the user.



Fat Client



Fat Clients

■ Advantages

- Fewer server requirements
- Offline working
- Better multimedia performance
- More flexibility
- Using existing infrastructure
- Higher server capacity

■ Disadvantages

- Complexity in maintenance
- Security issues
- Higher cost

Diskless Node

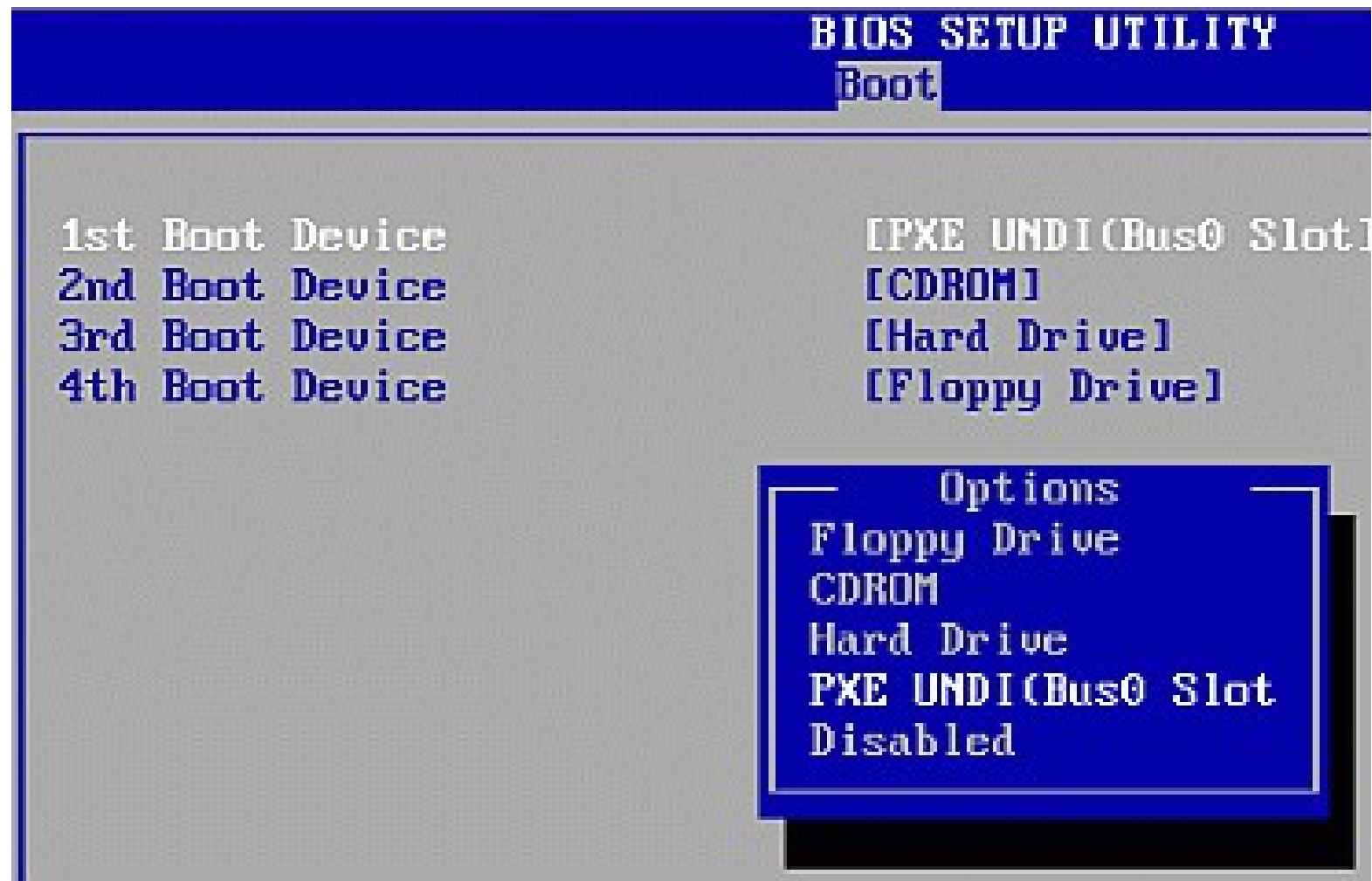
- No disk drives to operate
- Utilize network boot to load the OS
- Uses PXE (Preboot Execution Environment) protocols to find the server and load the kernel

	Centralized computing or Thin client	Diskless node	Fat client
Local hard drives used	No	No	Yes
Local general-purpose processing used	No	Yes	Yes

Diskless Node

- Advantages over thin client
 - Distributed load
 - Better multimedia performance
 - Peripheral support
- Disadvantages from thin client
 - Hardware is more expensive
 - Consume more bandwidth

Examples



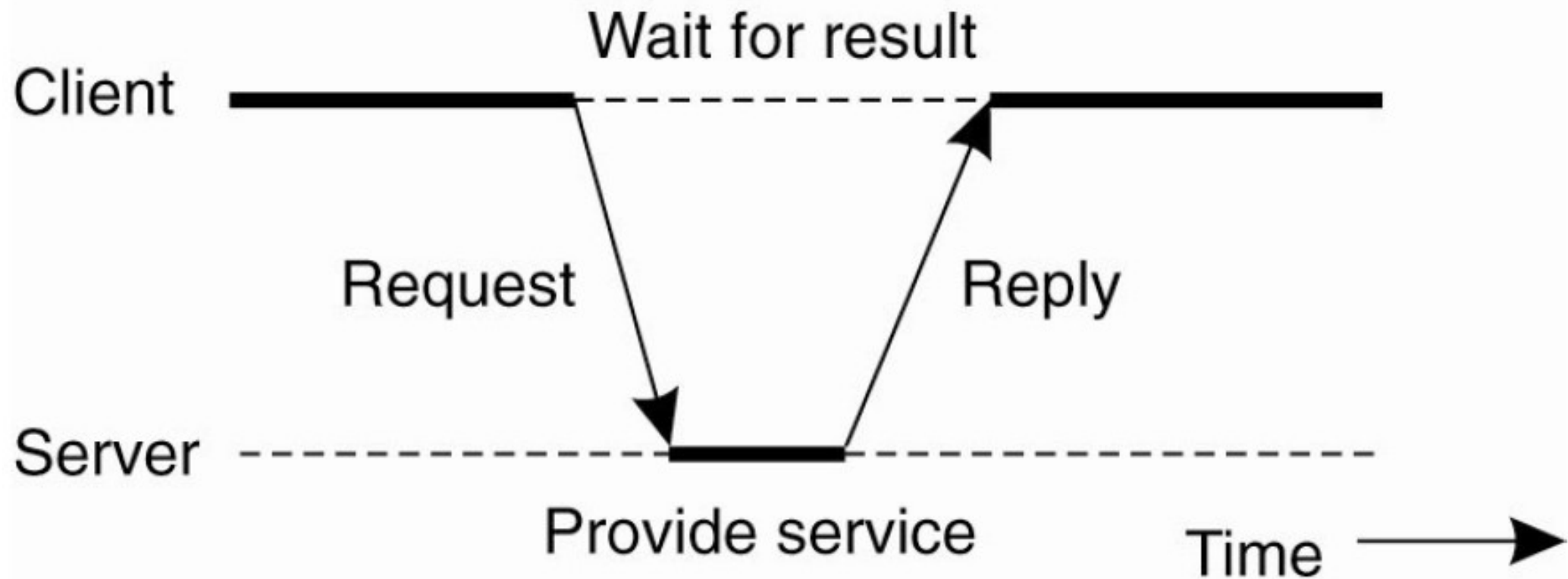
Example

```
Machine  Devices  Help
MAC: 08:00:27:A9:A8:7C UUID: 56424f58-0000-0000-0000-080027a9a87c
Searching for server (DHCP).....
Me: 192.168.99.151, DHCP: 192.168.99.2, Gateway 192.168.99.1
Loading 192.168.99.2:gppe/undionly.kppe ... (PXE).....
.....done
PXE->EB: !PXE at 9F00:0000, entry point at 9F00:0680
        UNDI code segment 9F00:0B1D, data segment 9E00:1000 (632-639kB)
        UNDI device is PCI 00:03.0
        632kB free base memory after PXE unload
gPXE initialising devices...

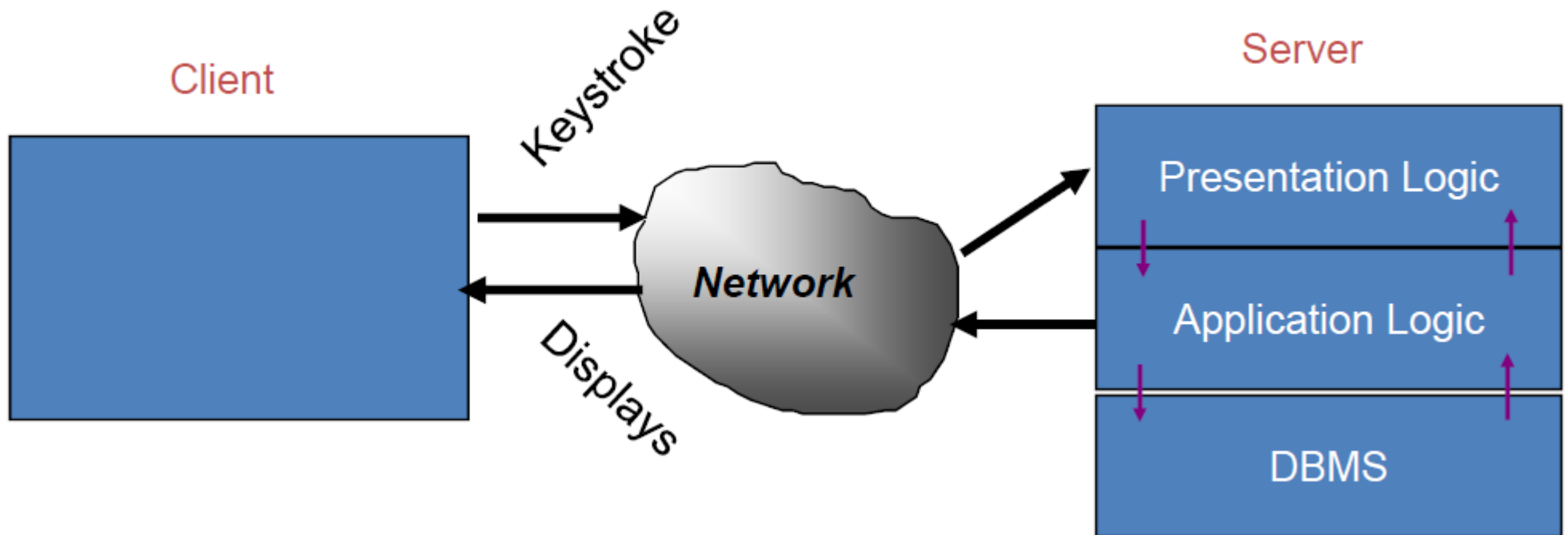
gPXE 0.9.7 -- Open Source Boot Firmware -- http://etherboot.org
Features: HTTP DNS TFTP AoE iSCSI bzImage COMBOOT ELF Multiboot PXE PXEXT

net0: 08:00:27:a9:a8:7c on UNDI (open)
  [Link:up, TX:0 TXE:0 RX:0 RXE:0]
Waiting for link-up on net0... ok
DHCP (net0 08:00:27:a9:a8:7c).... ok
net0: 192.168.99.152/255.255.255.0 gw 192.168.99.1
Booting from filename "gppe/menu.gppe"
tftp://192.168.99.2/gppe/menu.gppe._
```

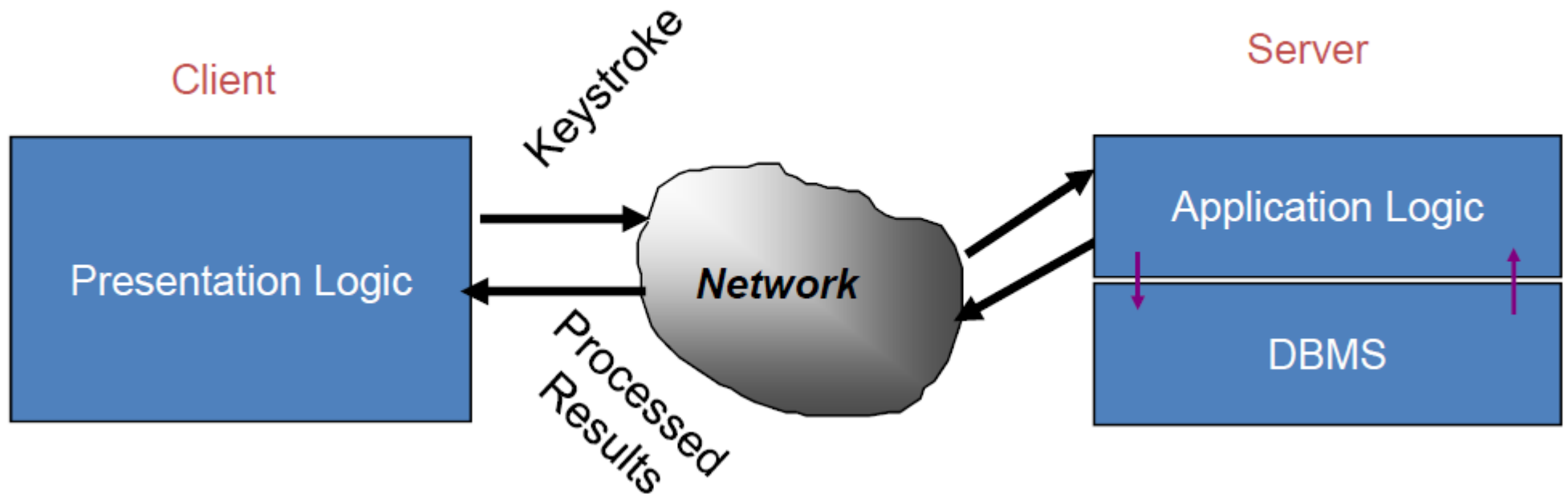

Client / Server Interactions



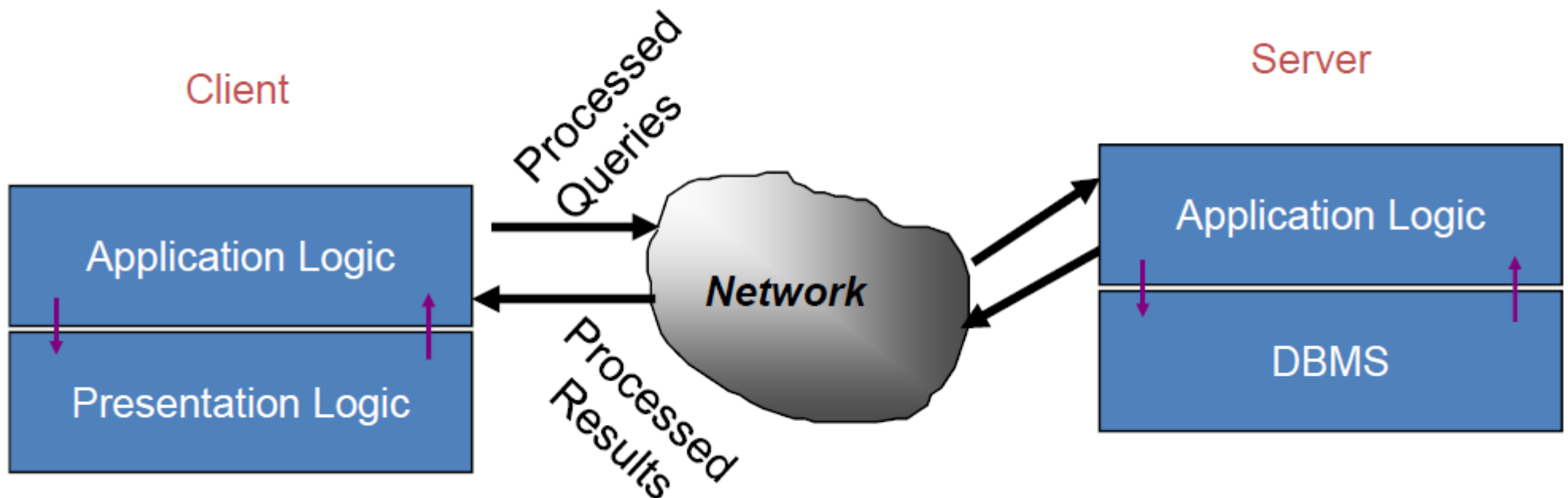
Client (dumb) – Server Model



Client – Server Model



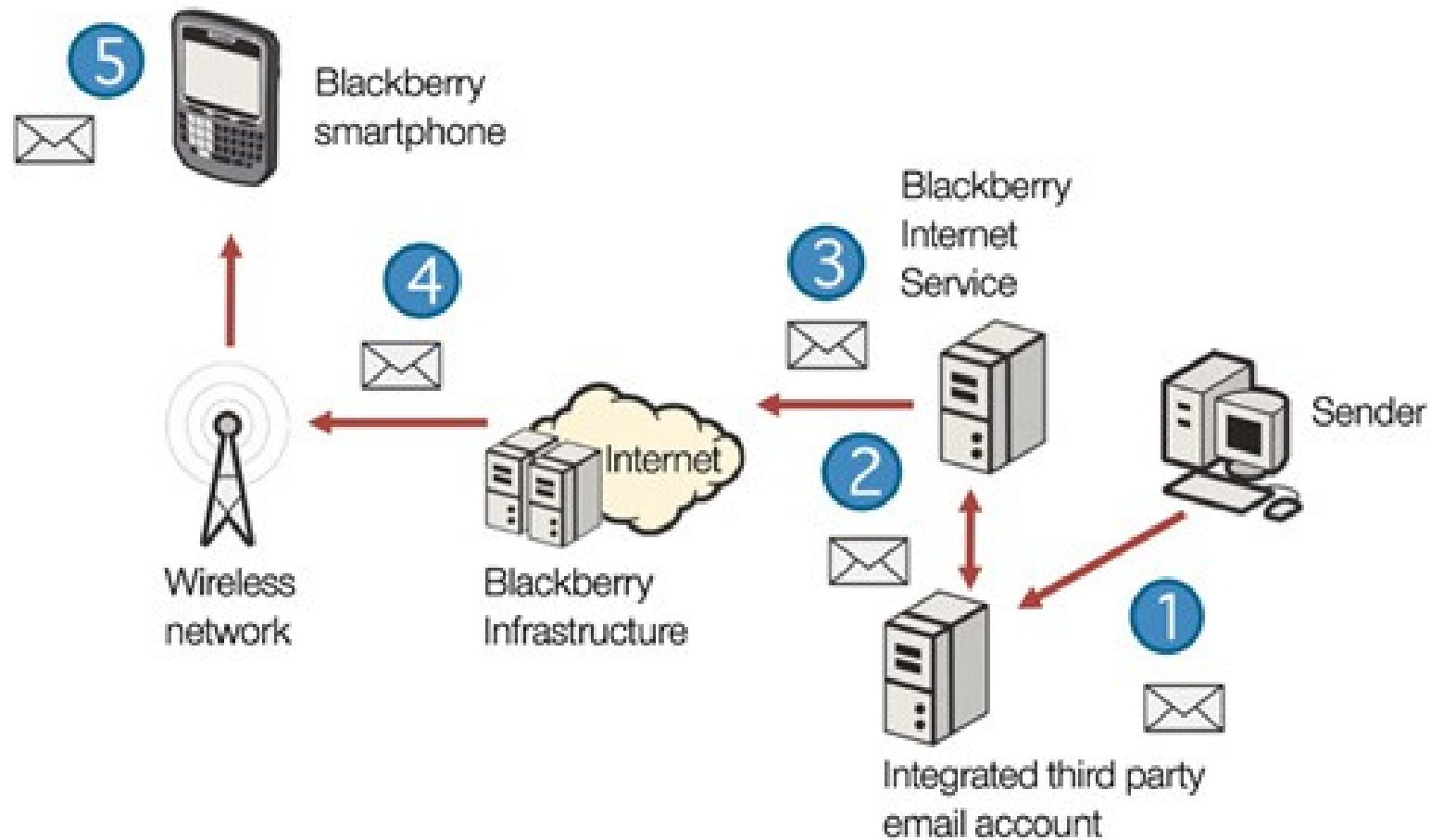
Distributed Client – Server Model



Client / Server Characteristics

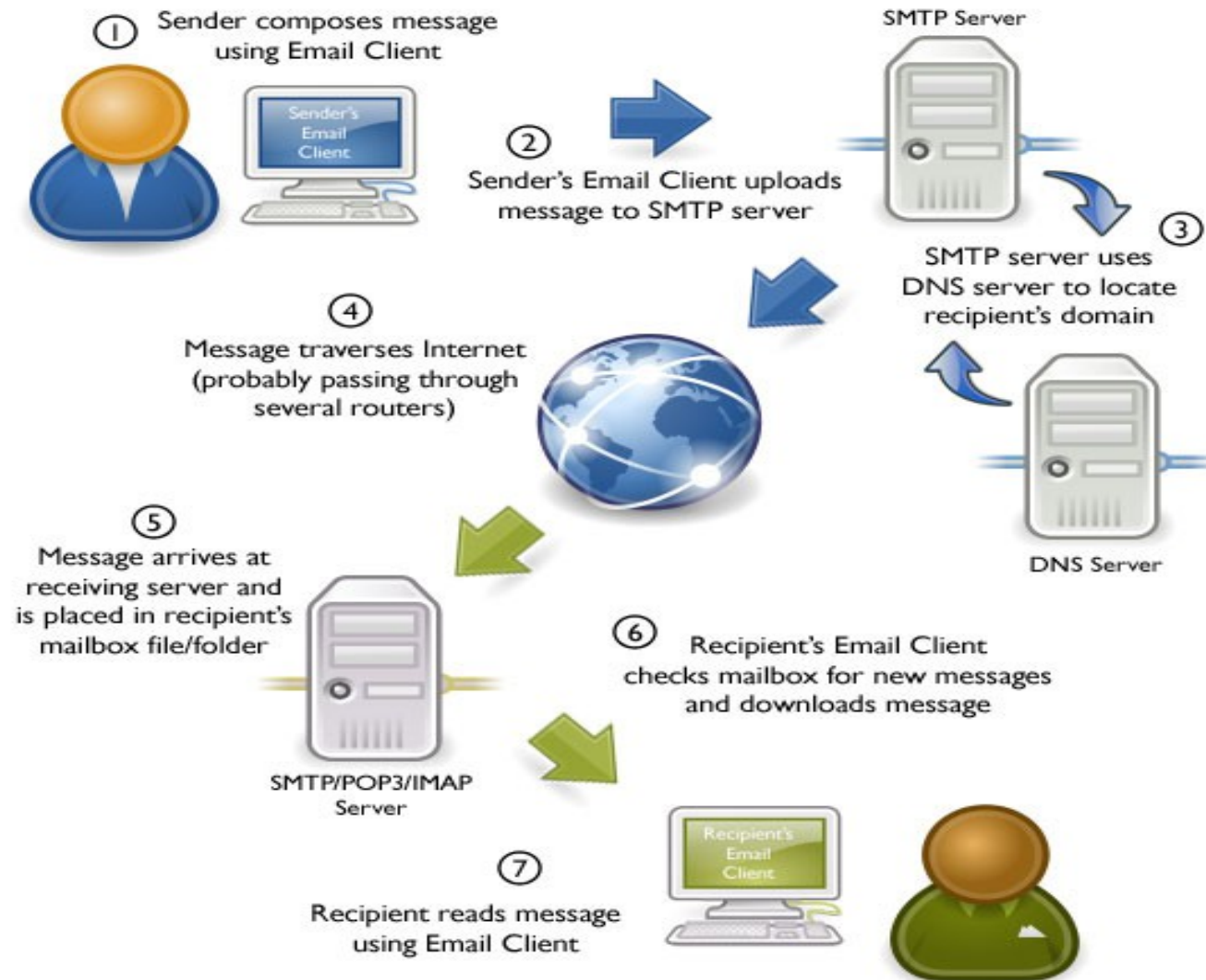
- Service
- Shared resources
- Asymmetrical protocols
- Mix-and-match
- Encapsulation of service
- Transparency location
- Message-based exchange
- Scalability
- Integrity

Push Technology



Email messages sent to an integrated third-party email account

SMTP



Pull Technology

Add New Account [X]

Internet E-mail Settings
Each of these settings are required to get your e-mail account working.

User Information

Your Name:

E-mail Address:

Server Information

Account Type: ▼

Incoming mail server:

Outgoing mail server (SMTP):

Logon Information

User Name:

Password:

☒ Remember password

☐ Require logon using Secure Password Authentication (SPA)

Test Account Settings

After filling out the information on this screen, we recommend you test your account by clicking the button below. (Requires network connection)

☒ Test Account Settings by clicking the Next button

Deliver new messages to:

☒ New Outlook Data File

☐ Existing Outlook Data File

Google Reader

Google reader

All items



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Ars Technica (322)

Week in Apple: Apple's textbook push, why video pros are disgruntled, and more

Apple held its education-focused event in New York City this week where it introduced the new iBooks 2, iBooks, Author, and iTunes U apps. Educators seem to feel pretty positive about the announcements, too, but that's not all that happened this ...

See more from [News](#) (1000+)



Blogger Buzz (1)

Engage with your readers through threaded commenting

You may have noticed that we've rolled out a number of improvements to Blogger recently. The folks over at Technorati referred to it as a "rampage". Call it what you like, we're definitely having fun giving Blogger the makeover it's long deserved, and ...

See more from [Google Products](#) (54)



Chromium Blog (2)

Real-time Communications in Chrome

Since we open sourced WebRTC this past summer, we've been working hard with browser vendors to integrate WebRTC technology in their products. Today, we reached an important milestone: WebRTC is now integrated in the Chrome browser available on the dev ...

See more from [Google Products](#) (54)

Comicstrip, Linux, Ruby and Chicken's Life. (2)

Beras & Gadget

Pagi-pagi mendengar kabar di timeline, lagi-lagi satu lagi gadget terselamatkan oleh beras. Baca juga: How to Save a Wet iPhone or iPod Touch.

See more from [Comic](#) (37)

Custom Search Engine (1)

Custom Search JavaScript API is now fully documented!

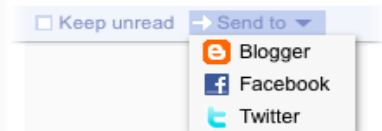
Recently read

How to do Untethered Jailbreak & Preserve the Baseband on iPhone4/iPhone3GS running iOS 4.3.1 via PWNAGE Tool [Guide] from [FreakGeeks](#)

First Nintendo 3DS TV Commercial for US[Video] from [Tech Drive-in](#)

Tips and tricks

It's easier to share posts you like to Blogger, Twitter, Facebook, and more with our "Send to" feature. Just head over to the [settings](#) page, and enable the services you want to use.



If your favorite service isn't listed, you can create your own "Send to" link with a URL template.

Planet Planet



Willy Sudiarto
Raharjo

LibreOffice 3.4.5 Released

LibreOffice 3.4.5 has been released by The Document Foundation. It's a maintenance release, so no new features added, but you can expect bug fixes on this release. If you have a bug reported on previous release, you might want to check the first and second changelogs.

Eric has compiled LibreOffice 3.4.5 for Slackware users and upload it to his repository. Please enjoy this release as this might be the latest release for 3.4.x series as the developer are now working on the 3.5.x series and they even started the second bug hunting for LibreOffice 3.5 that will commence on January 21 and 22, 2012. The decided to put a second session after a successful first session that generates 70 bug reports from over 150 volunteers.

The next major release of LibreOffice, 3.5.0 is scheduled to be released on February, meaning it's less than 3 weeks from now.

January 17, 2012 11:42 PM



Willy Sudiarto
Raharjo

Fixing LibreOffice Printing Problem

If you use LibreOffice and you are having problem to print in landscape mode, then you are not alone. Some people reported this on LQ and i myself also experienced this problem.

Some members reported a fix for this problem, but requires a lot of changes in the printer behaviour settings. Other member suggested that upgrading CUPS to 1.5.0 should fix this problem and this is what i choose.

Of course, it's not that smooth to upgrade to the latest cups. I had some problem building it and it was discussed on LQ, but finally i'm able to build cups by removing the old patches on Slackware-Current's SlackBuild script.

Now i'm able to build CUPS and fix the problem on LibreOffice. Hopefully this helps for those having same problems with me and with other Slackware users.

January 17, 2012 08:46 AM

January 16, 2012



UEFI Secure Boot - Solusi Microsoft Yang Paling Gak Mutu



Pernahkah anda membeli sebuah barang dan setelah membeli anda diminta untuk menandatangani

Slackware-ID

Planet Slackware-ID adalah aggregator dari situs blog para Slacker* Indonesia.
(*Pengguna Distro Slackware)

Silakan kirimkan e-mail ke willysr@slackware-id.org apabila blog Anda ingin disertakan pada planet ini.

Terakhir diupdate: January 22, 2012 04:01 AM GMT.

Google Groups

Subscribe to id-slackware

Email:

Subscribe

[Visit this group](#)

Penting!

SlackBook

Tempat Sharing

SlackBasics

SlackBuilds

Komunitas

Acwin (feed)

Aghe Milano (feed)

Anjar Hardiena (feed)

Budi Ariyanto (feed)

Gandi Wibowo (feed)

Hadi Sumarsono (feed)

Henry Hermawan (feed)

Henry Hermawan (feed)

Imron (feed)

Kemas Antonius (feed)

Kunto Aji (feed)

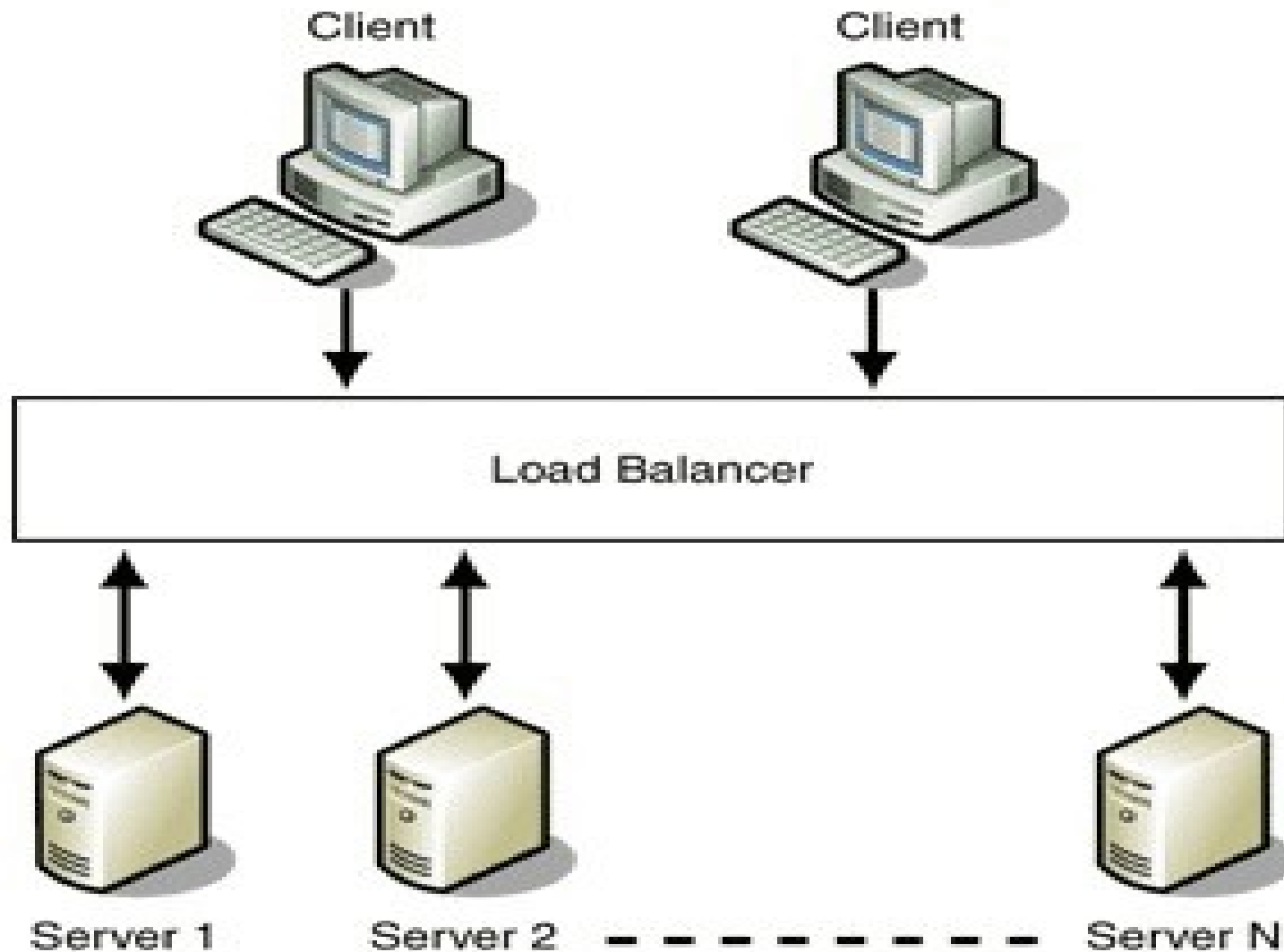
Latif Anshori Kurniawan

(feed)

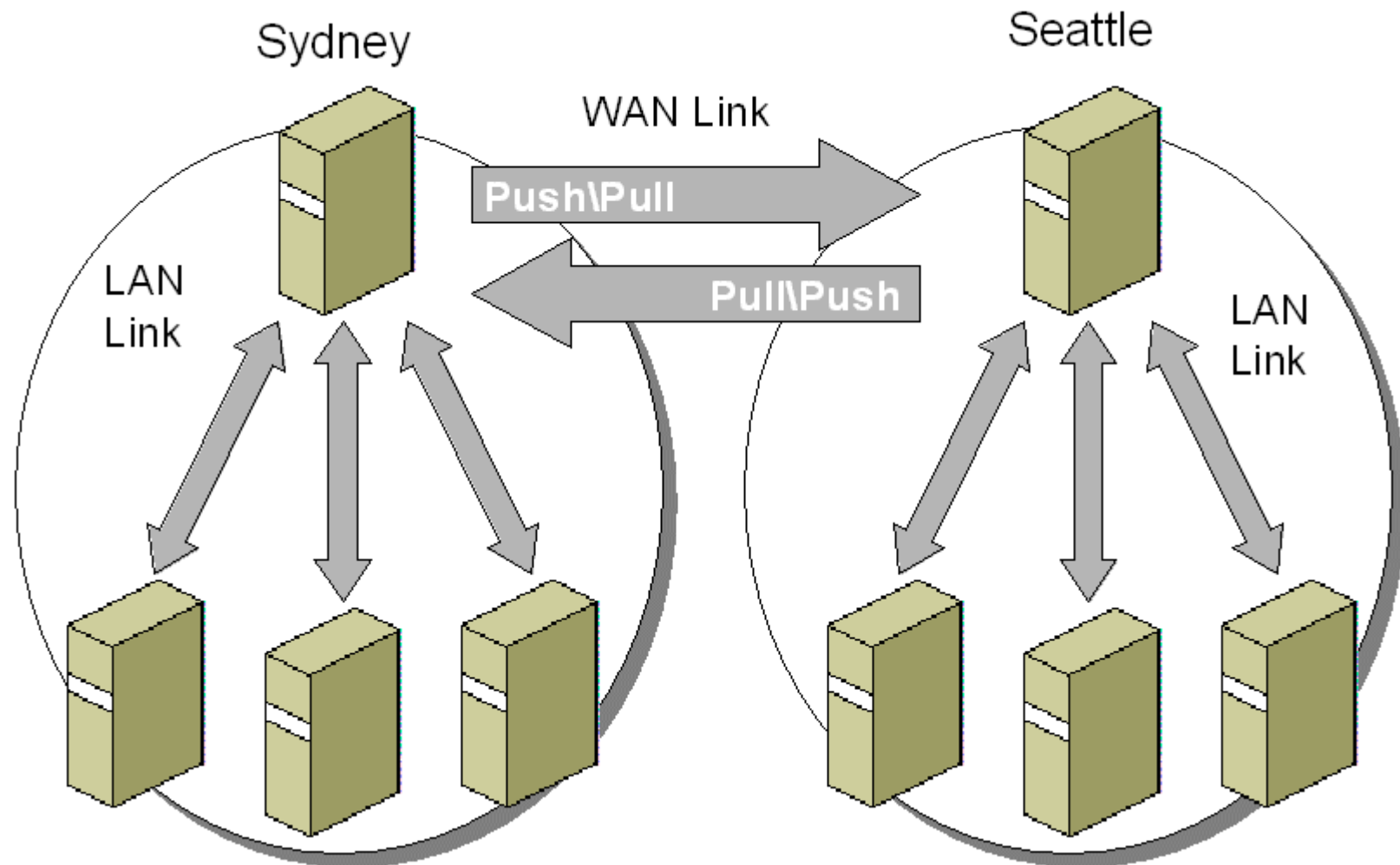
Makassar-Slackers (feed)

Martinus Ady H (feed)

Server Replication on Local Network

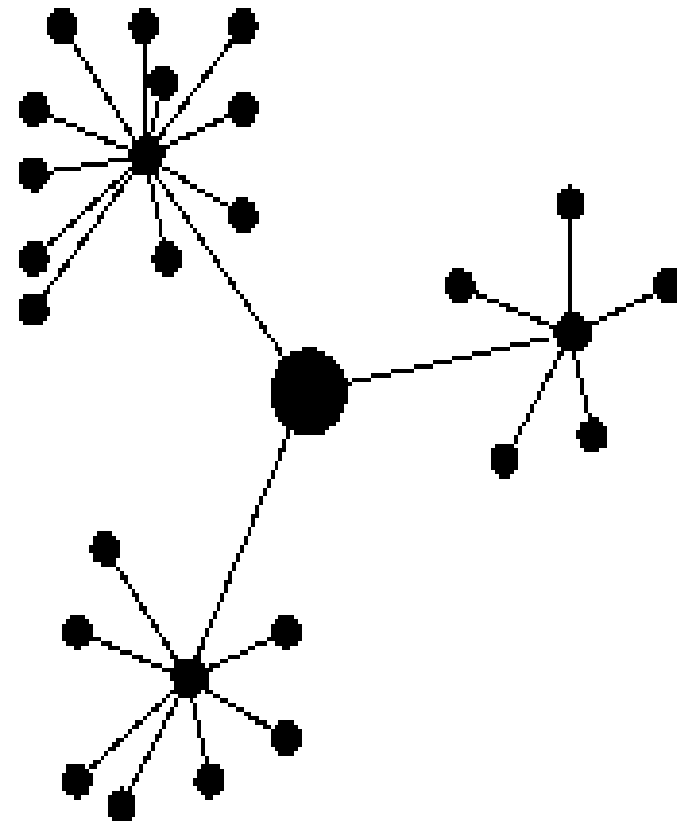
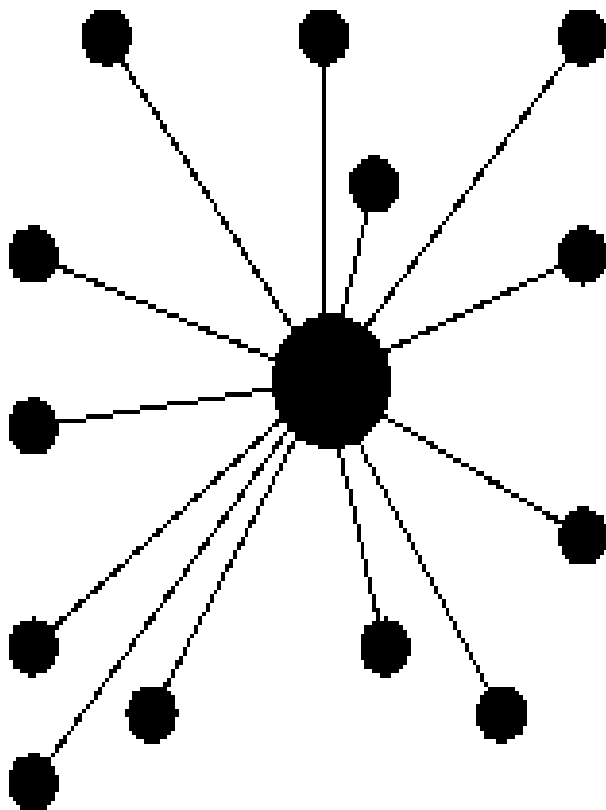


Server Replication Over WAN

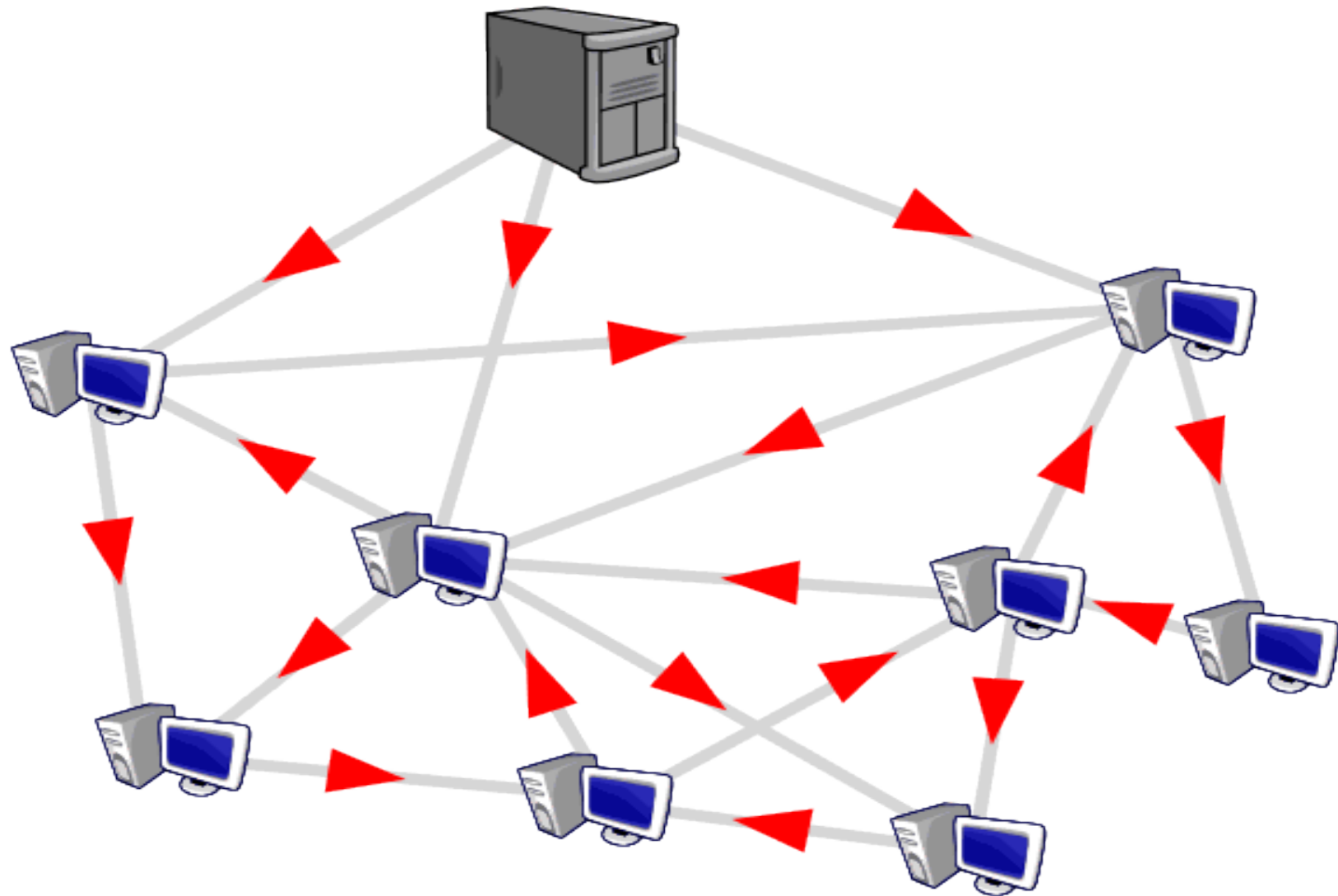


Technology Transition

Centralization and Decentralization

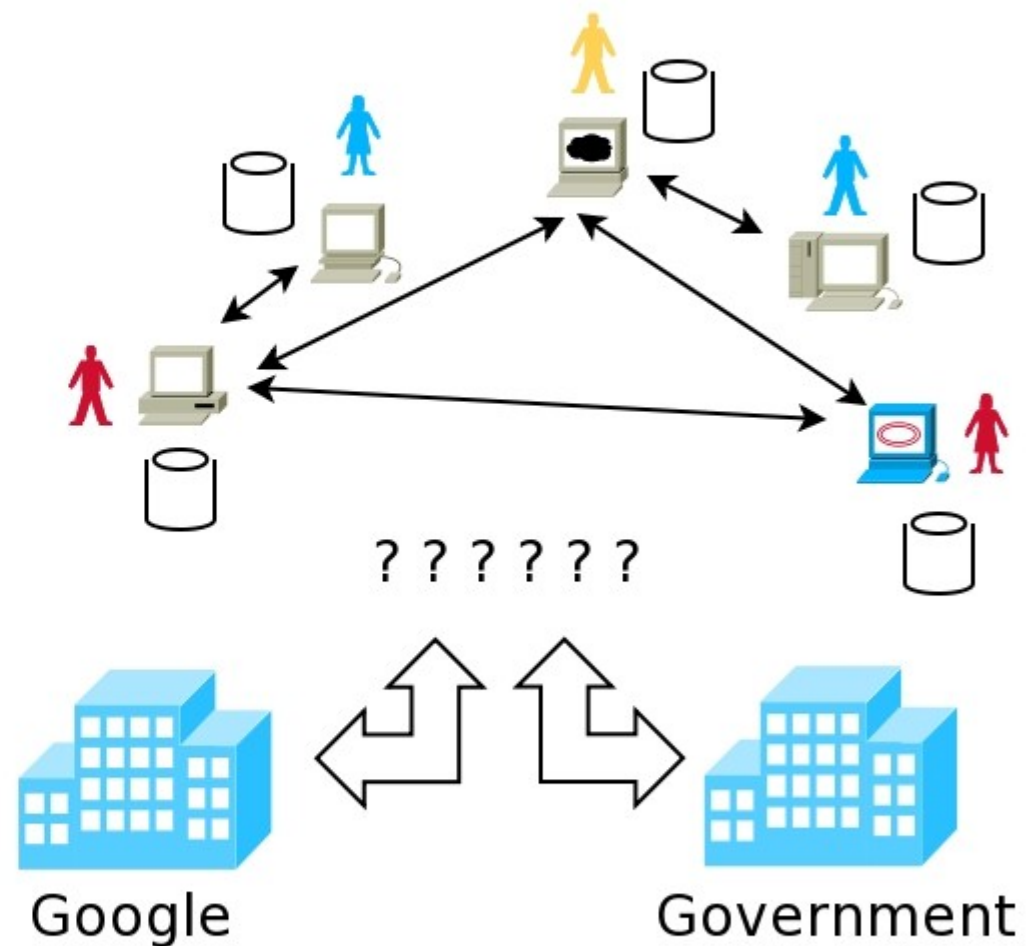


P2P Architecture



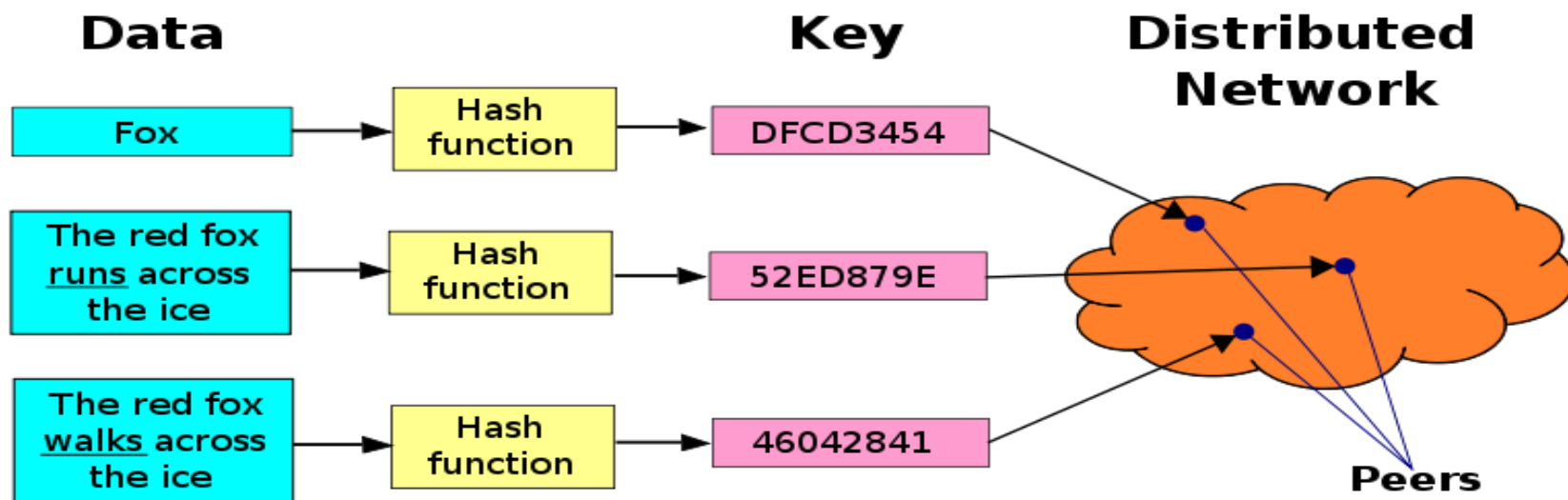
OPEN-SEARCH

- Peer-to-peer (p2p)
- No central database
- Distributed (no log)
- Redundant storage
- Free software



P2P Architecture

- Distributed
- Uses overlay network
 - Indexing
 - Peer discovery
- Structured P2P network
 - Distributed Hash Tables



P2P Goals

- Cost / Data Sharing
- Reduce operational cost
- Resource aggregation
- Improve reliability
- Increase Autonomy
- Anonymity
- Scalability

P2P Applications Examples

- File Sharing
 - Napster, Gnutella, KaZaa
- Process sharing
 - SETI@HOME, Folding@HOME, Distributed.Net
- Collaborative environment
 - Instant messaging, virtual communications

P2P Architecture

■ Advantages

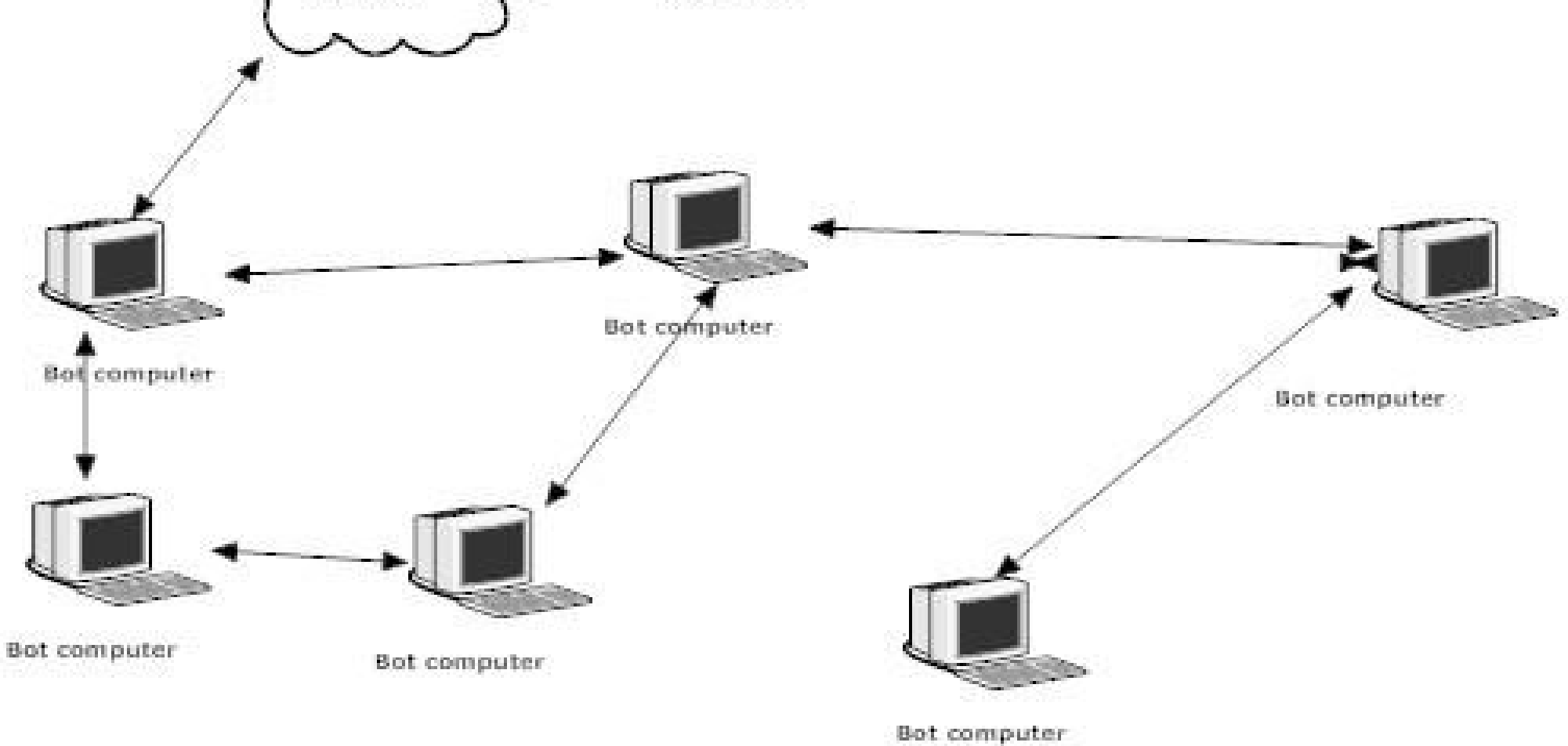
- No administrator required
- All nodes provides their resources
- Removed single point of failure
- Scalable

■ Disadvantages

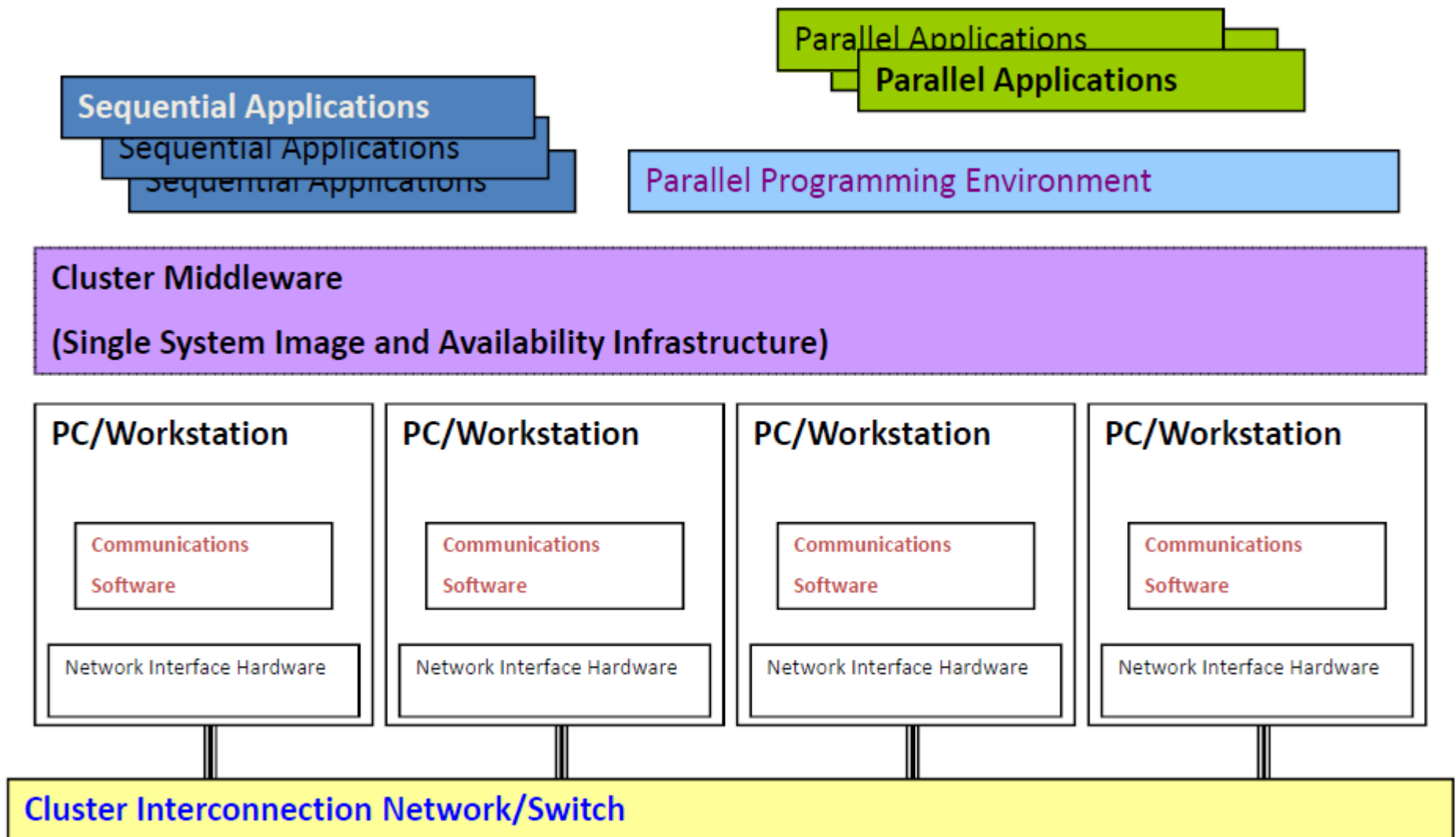
- Security issues
- Files may be lost once it's unpopular
- Consumes a lot of bandwidth

Command and control
architecture of a Peer-to-Peer botnet

The diagram illustrates the command and control architecture of a Peer-to-Peer botnet. It features a cloud labeled "Internet" on the left and a server rack labeled "Botmaster" on the right. A double-headed arrow connects the "Internet" cloud and the "Botmaster" server, indicating bidirectional communication.

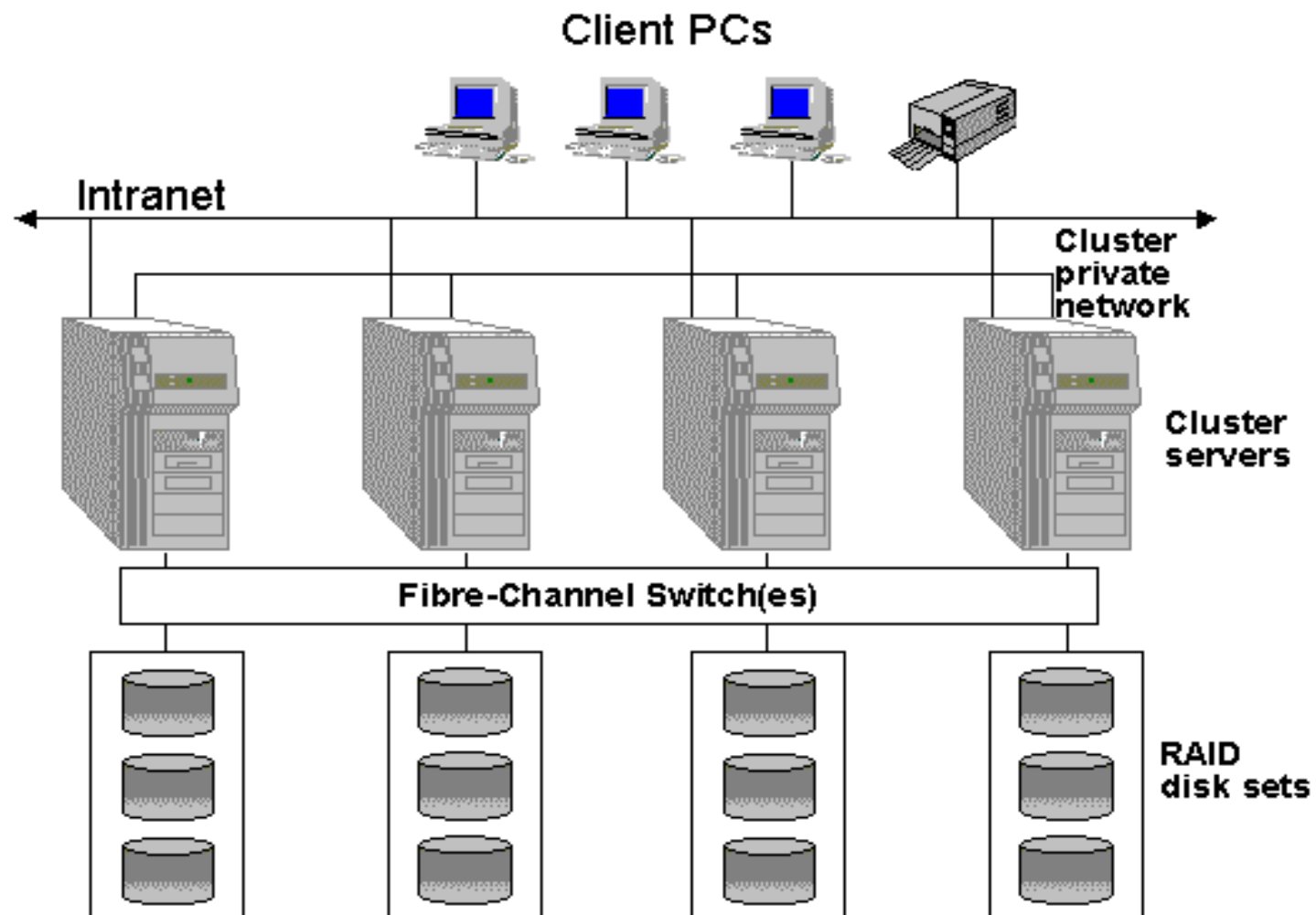


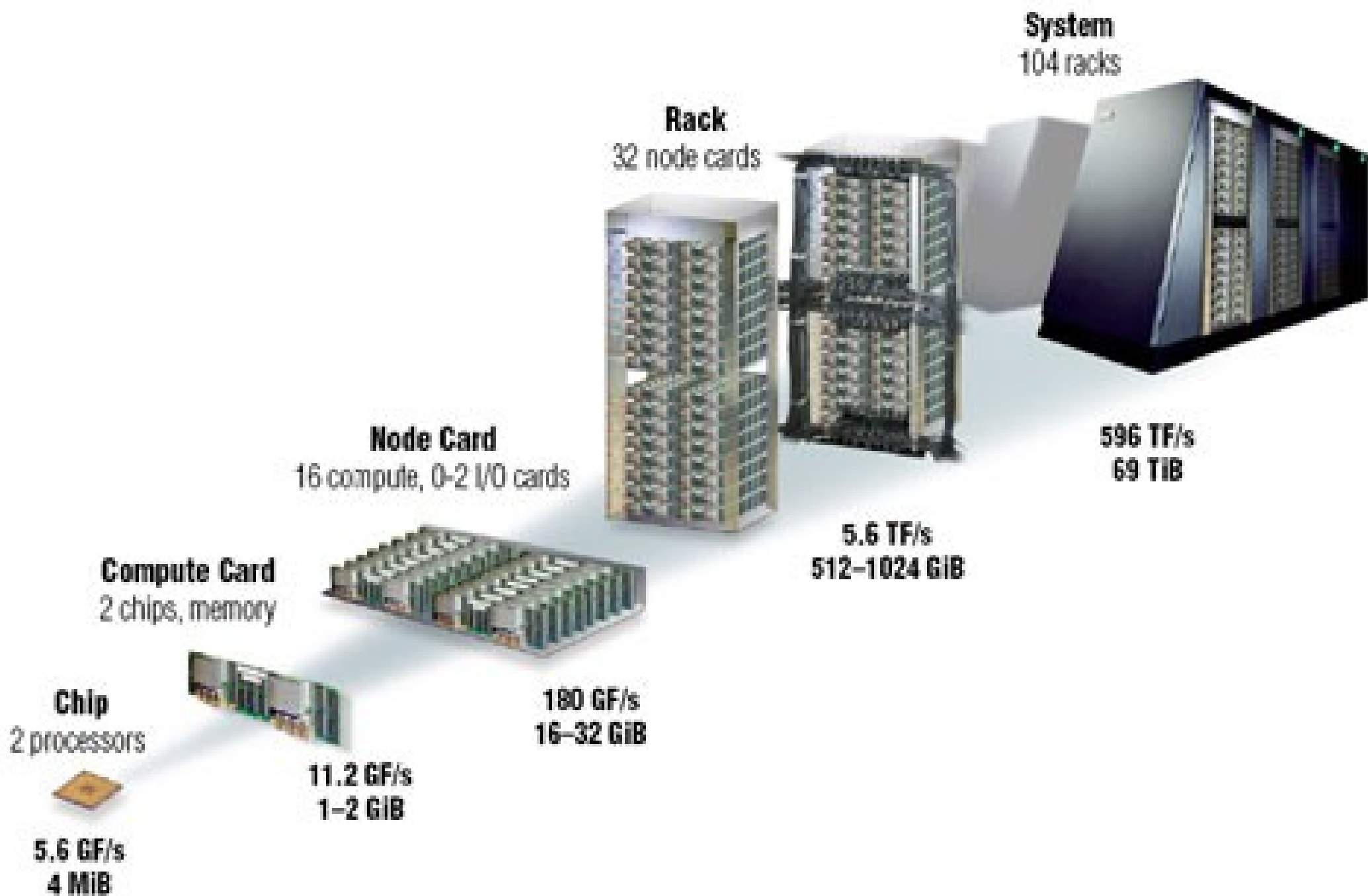
Clusters Architecture



Clusters Architecture

4-Node MSCS Cluster





Benefits of Clusters

- Scalable Performance
- High Availability
- Fault Tolerance
- Modular Growth
- Use of commodity components

Design Objectives

- Scalability
- Packaging
 - ◆ Compact
 - ◆ Slack
- Control
 - ◆ Centralized
 - ◆ Decentralized
- Homogeneity
 - ◆ Homogeneous
 - ◆ Heterogeneous
- Security
 - ◆ Exposed
 - ◆ Enclosed

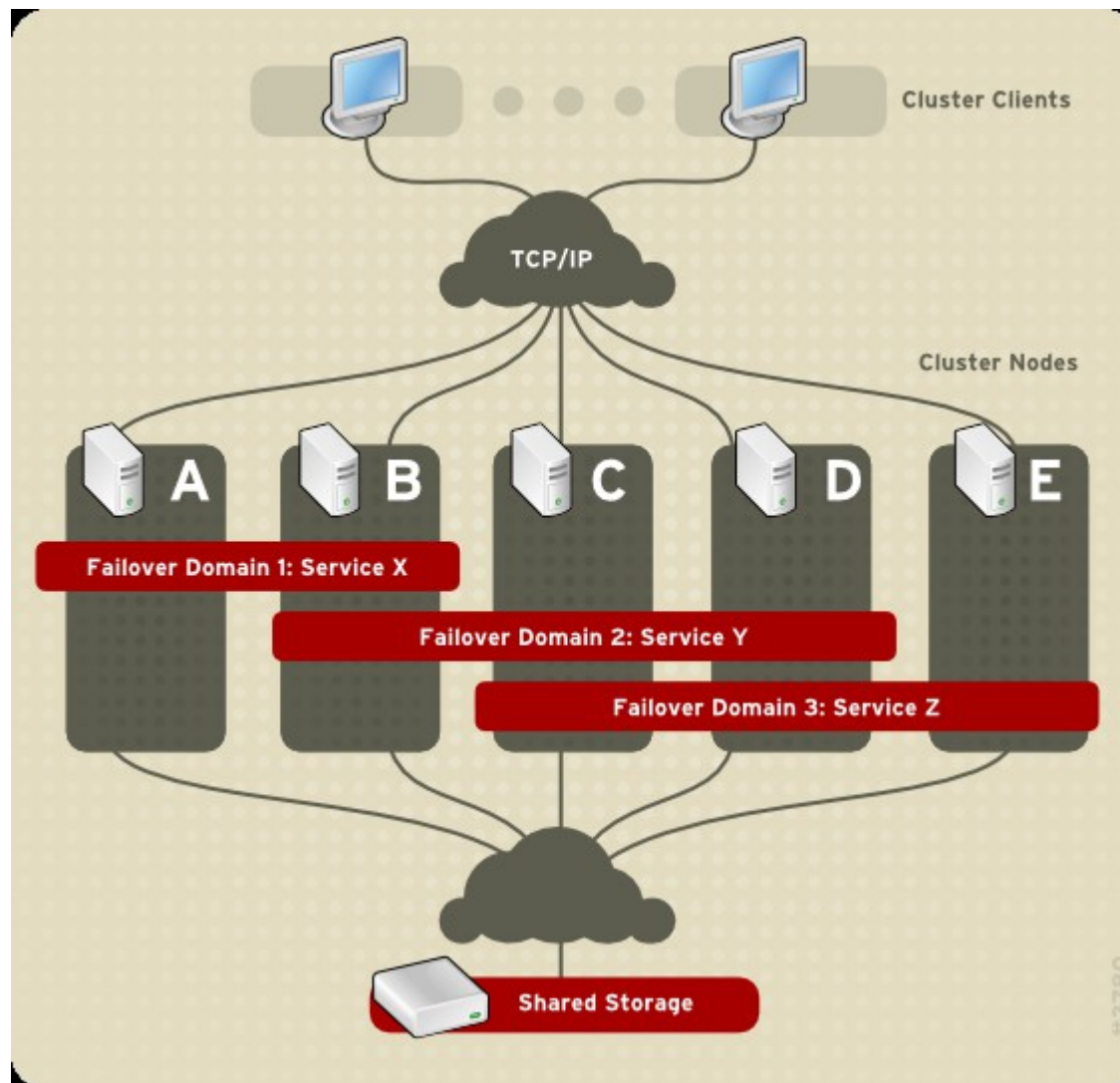
Types of Clusters

- Dedicated Cluster
 - ◆ Homogeneous
 - ◆ Centralized
 - ◆ Multi user
 - ◆ Enhanced throughput and reduced response time
- Enterprise Cluster
 - ◆ Geographically distributed
 - ◆ Multiple owner
 - ◆ Heterogeneous
 - ◆ Utilizing idle resources

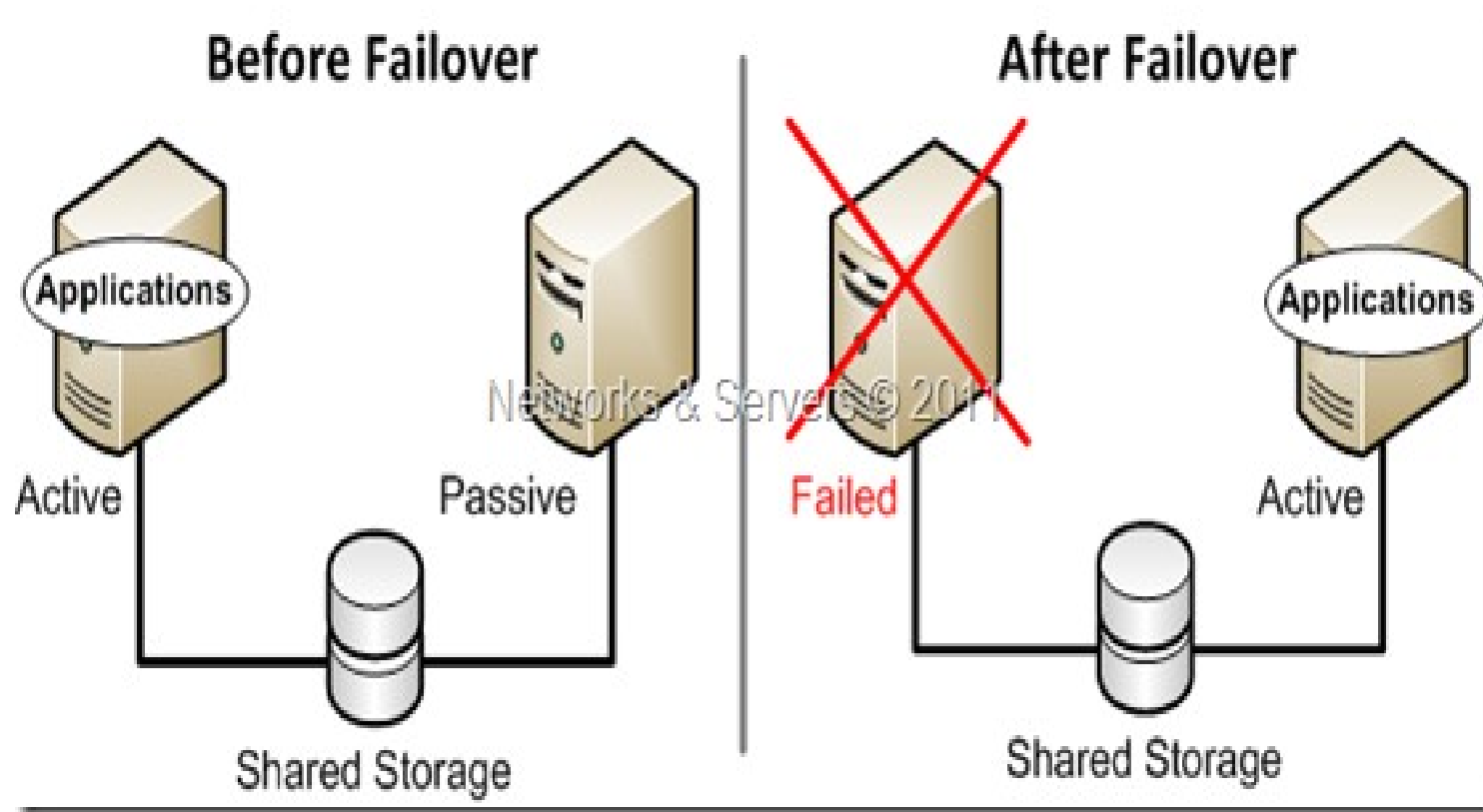
Cluster Family Classification

- Compute Clusters
 - ◆ Collective computation over a single large job
 - ◆ Do not handle many I/O operations
 - ◆ Mostly homogeneous and tightly coupled
 - ◆ Known as beowulf cluster
- High Availability Clusters
 - ◆ Fault-tolerant
 - ◆ At minimum 2 nodes
- Load Balancing Clusters
 - ◆ Share workload among nodes

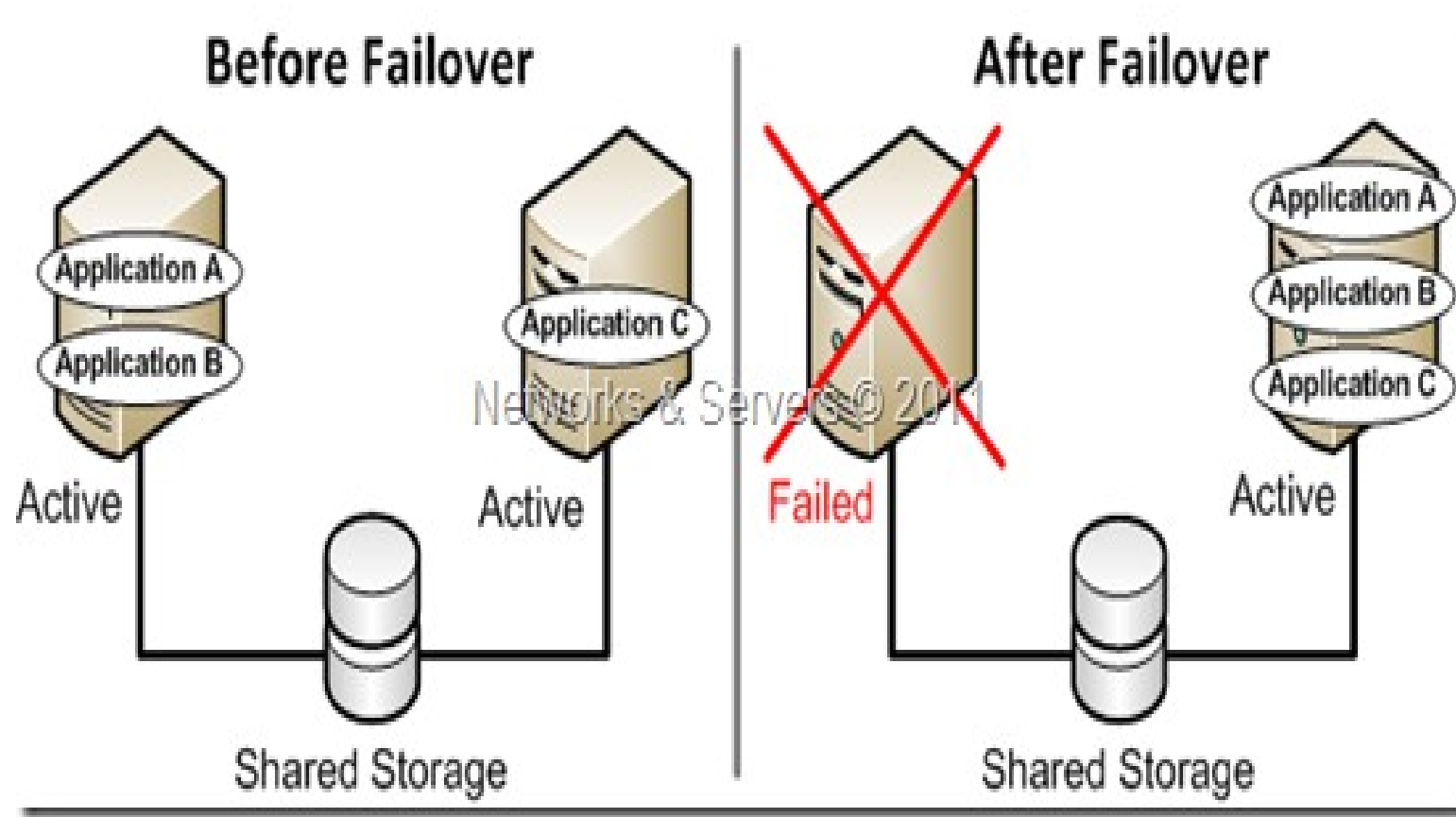
High Availability Clusters



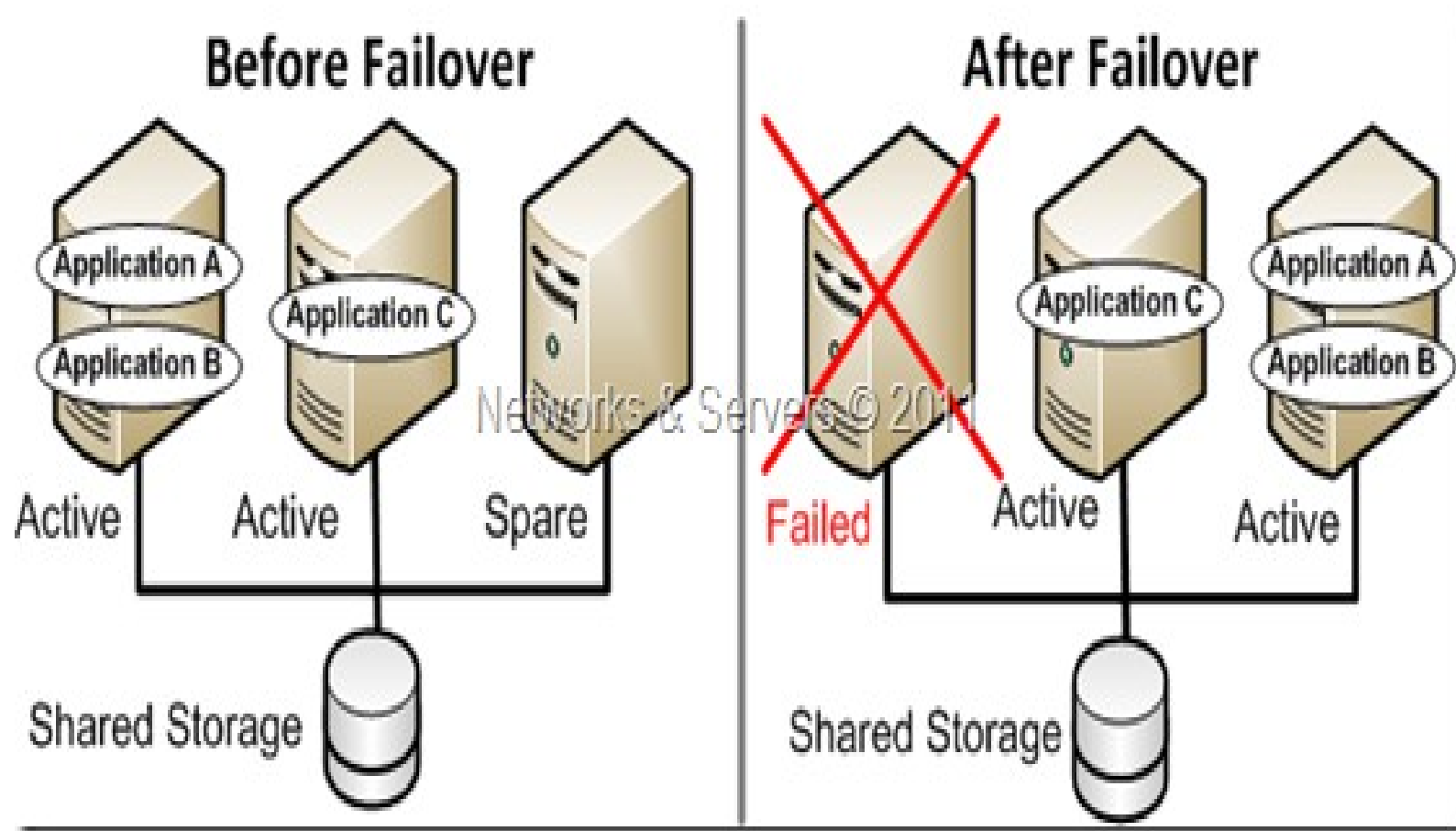
Asymmetric (Active/Passive) Clusters



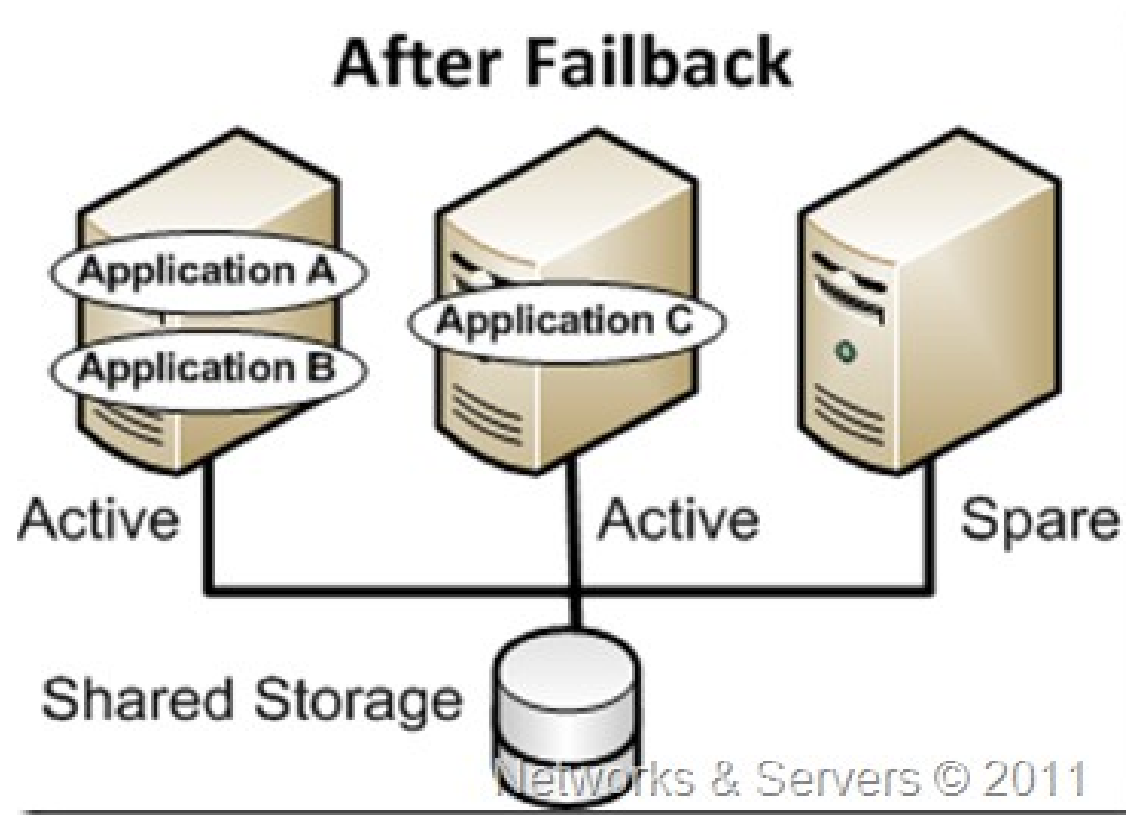
Symetric (Active/Active) Clusters



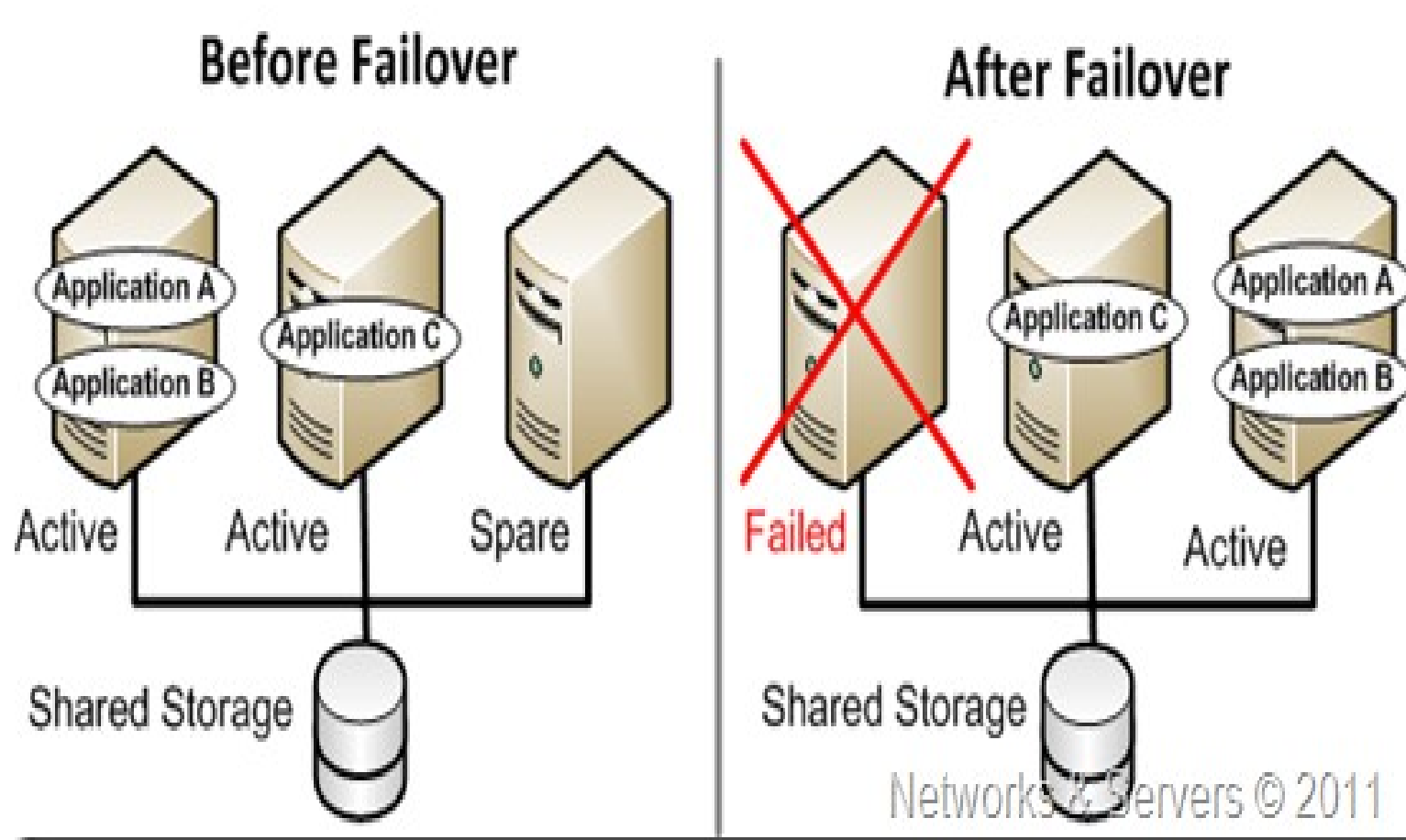
N-1 Clusters



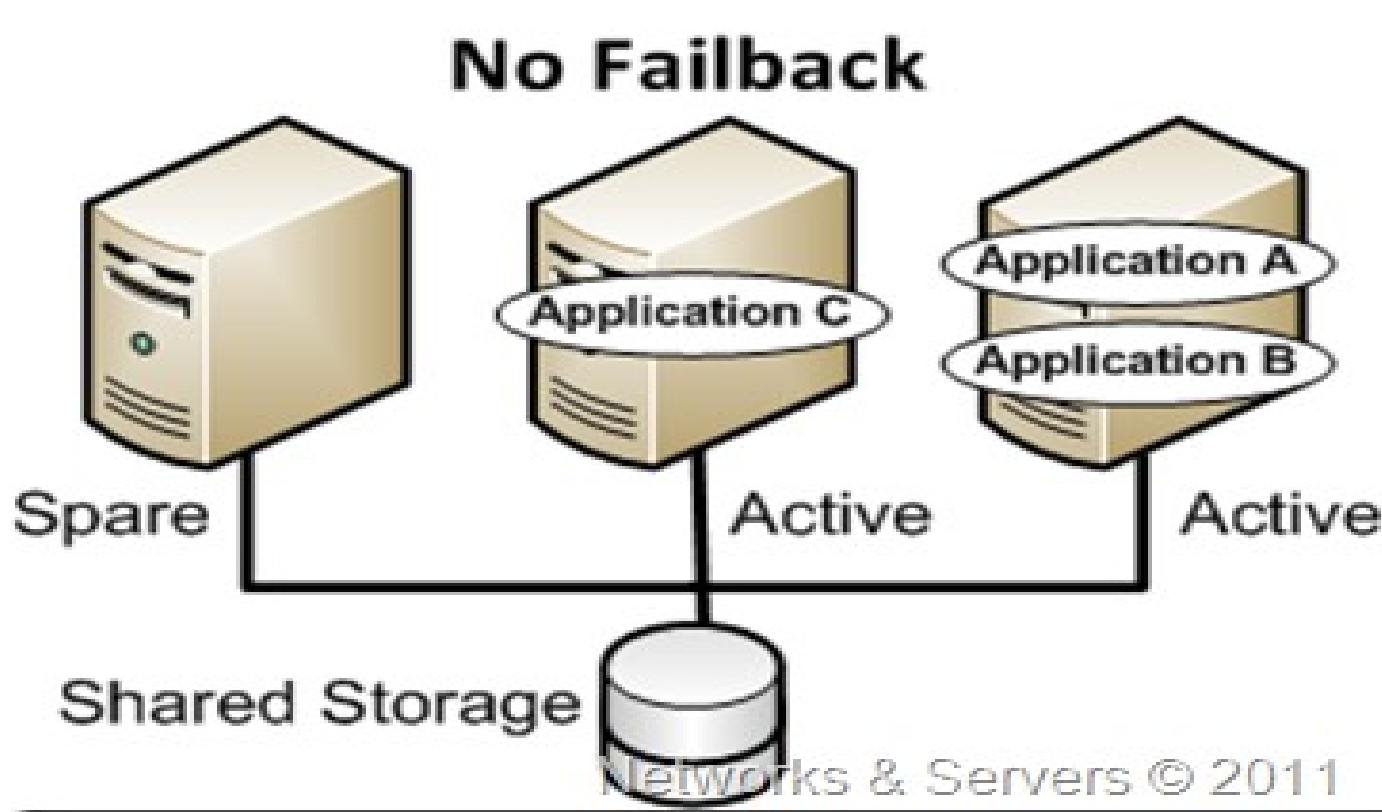
N-1 Clusters



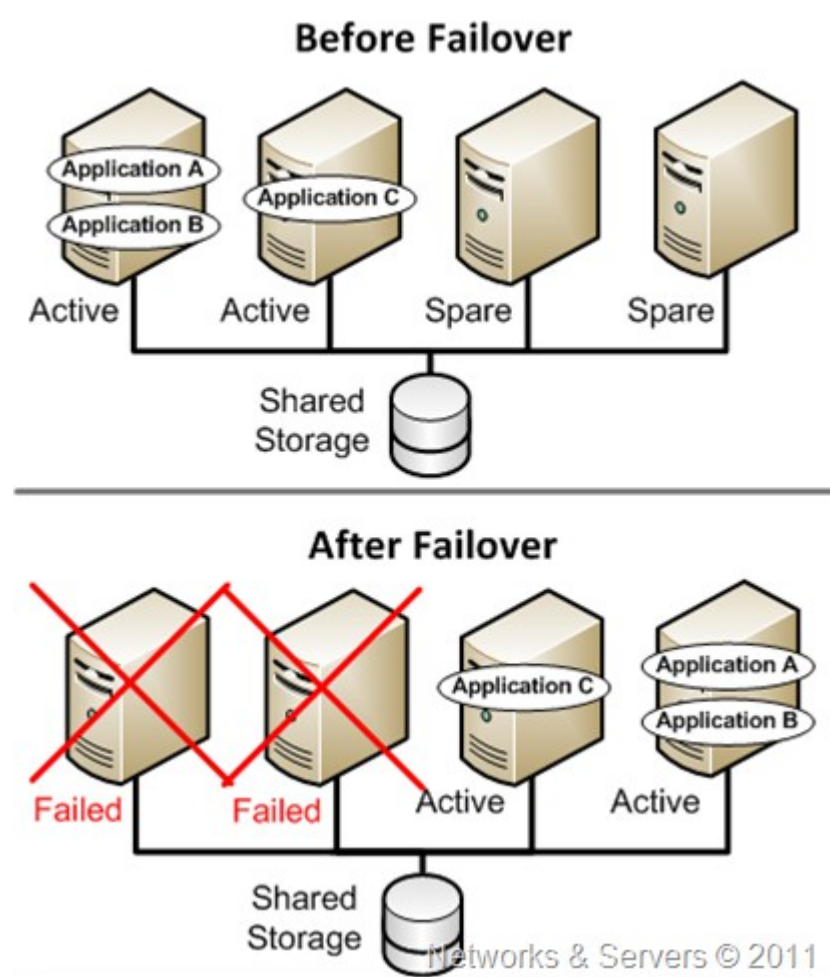
N+1 Clusters



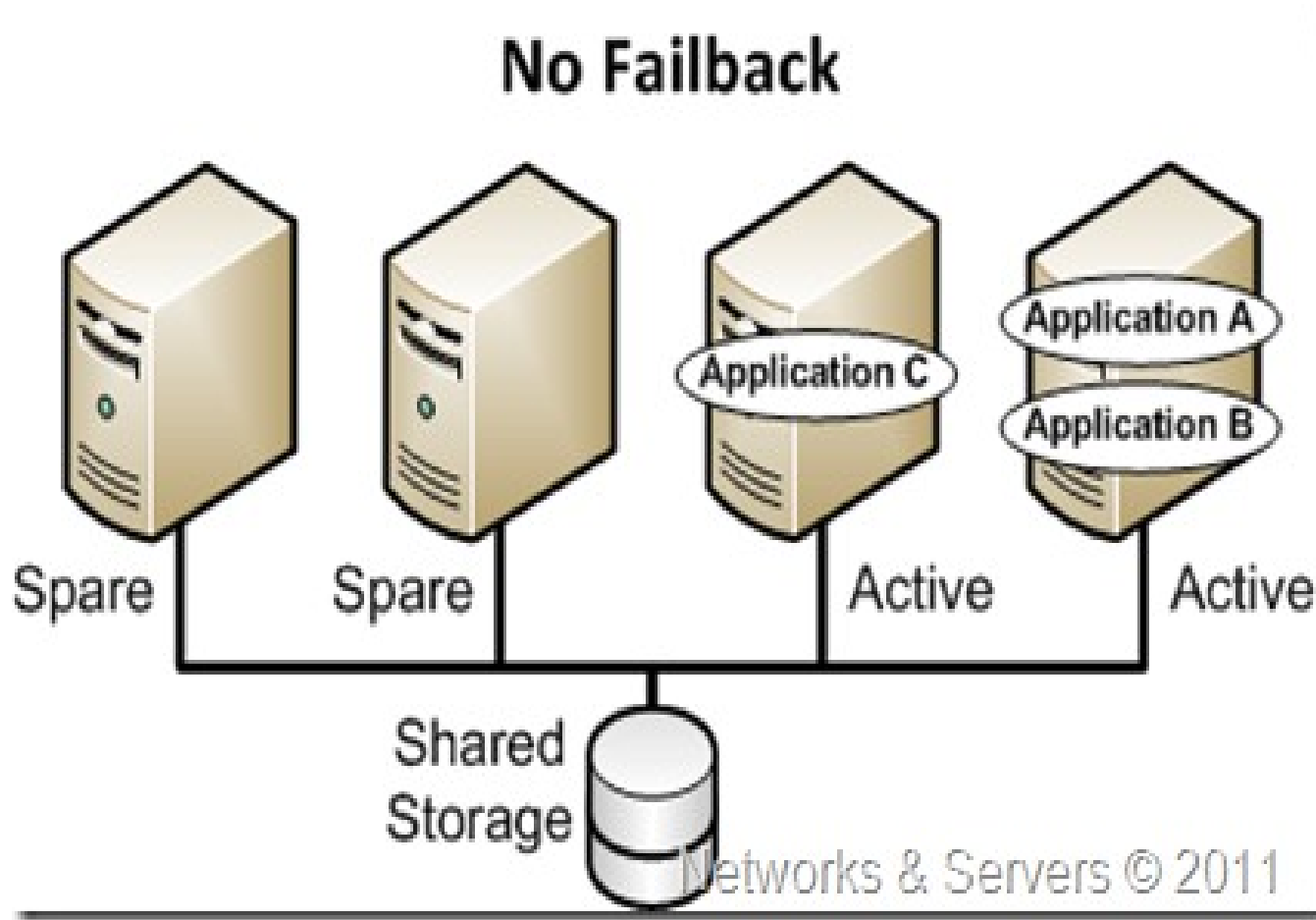
N+1 Clusters



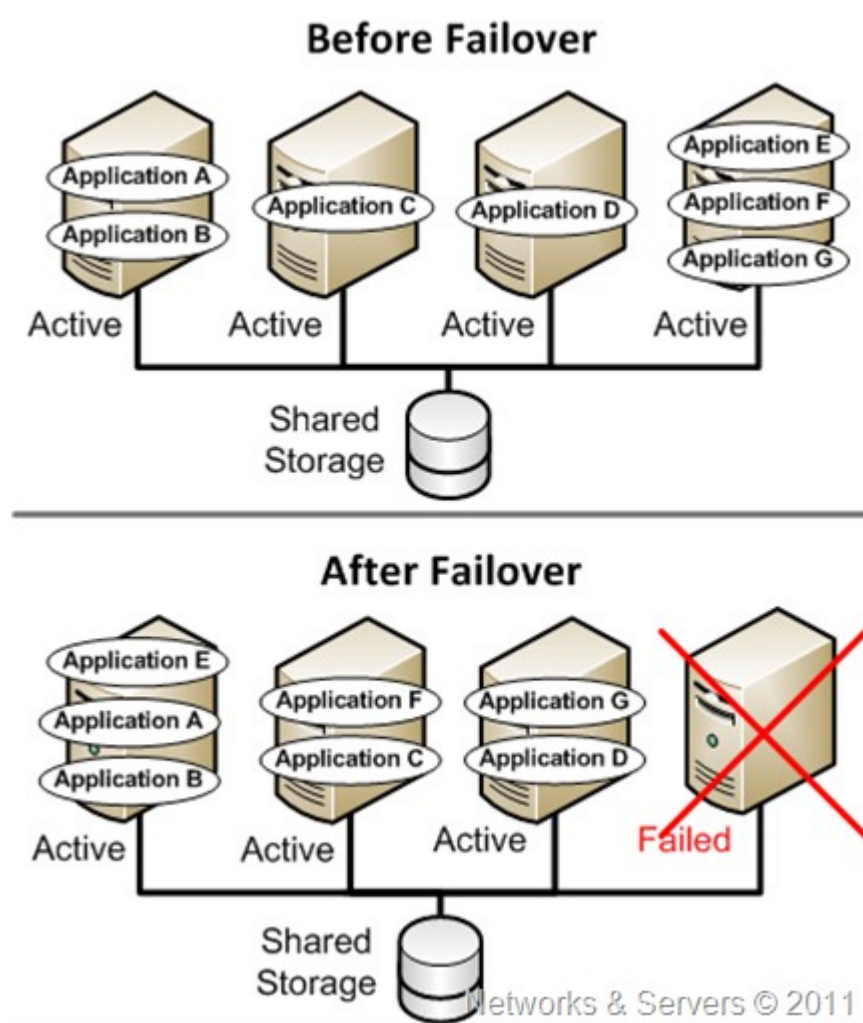
N+M Clusters



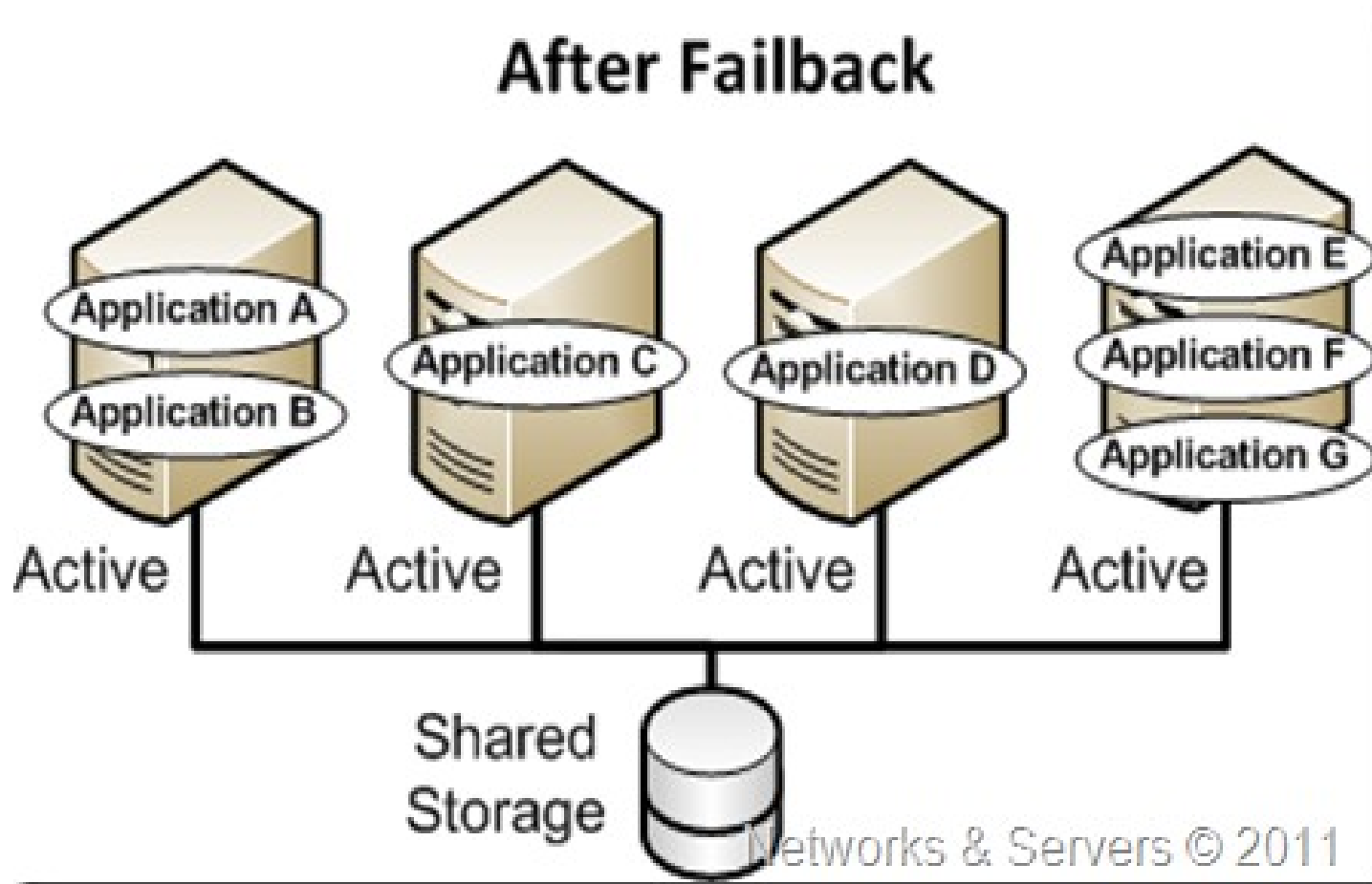
N+M Clusters



N-to-N Clusters



N-to-N Clusters



Grid Computing

What is all about Grid ?

- 1) Sharing, Selecting, aggregation of resources with a policy universally agreed.
- 2) Distributive supercomputing for a better future



Grid Architecture

Applications

High
Energy
Physics

Cosmology

Chemical
Engineering

Climate

Combustion

Astrophysics

... Business

Applications Toolkits

Data
Grid

Remote
Computation

Remote
Visualization

Collaboratories

Portals

... Remote
Sensors

Grid Services

Protocols, authentication, policy, instrumentation, resource management,
discovery, events, etc.

Grid Fabric

Storage, networks, computers, display devices, etc.
And their associated local services

Grid Applications

- Distributed Supercomputing
- High-throughput Computing
- On-demand Computing
- Data-intensive Computing
- Collaborative Computing

Examples

- SETI@Home project
- BOINC (Berkeley Open Infrastructure for Network Computing)
- Folding@Home
- Einstein@Home
- GIMPS – Great Internet Mersenne Prime Search
- LHC@home
- World Community Grid