

What is SANergy, How does it work, What's it good for ?

Dimitri Chernyshov
Marketing Manager - SANergy Team
Storage Business Unit

Tivoli

Three Ways to use Storage Area Networks

1. Physically Consolidated Storage

All your storage in one geographical location

2. Partitioned, LUN Masked RAID

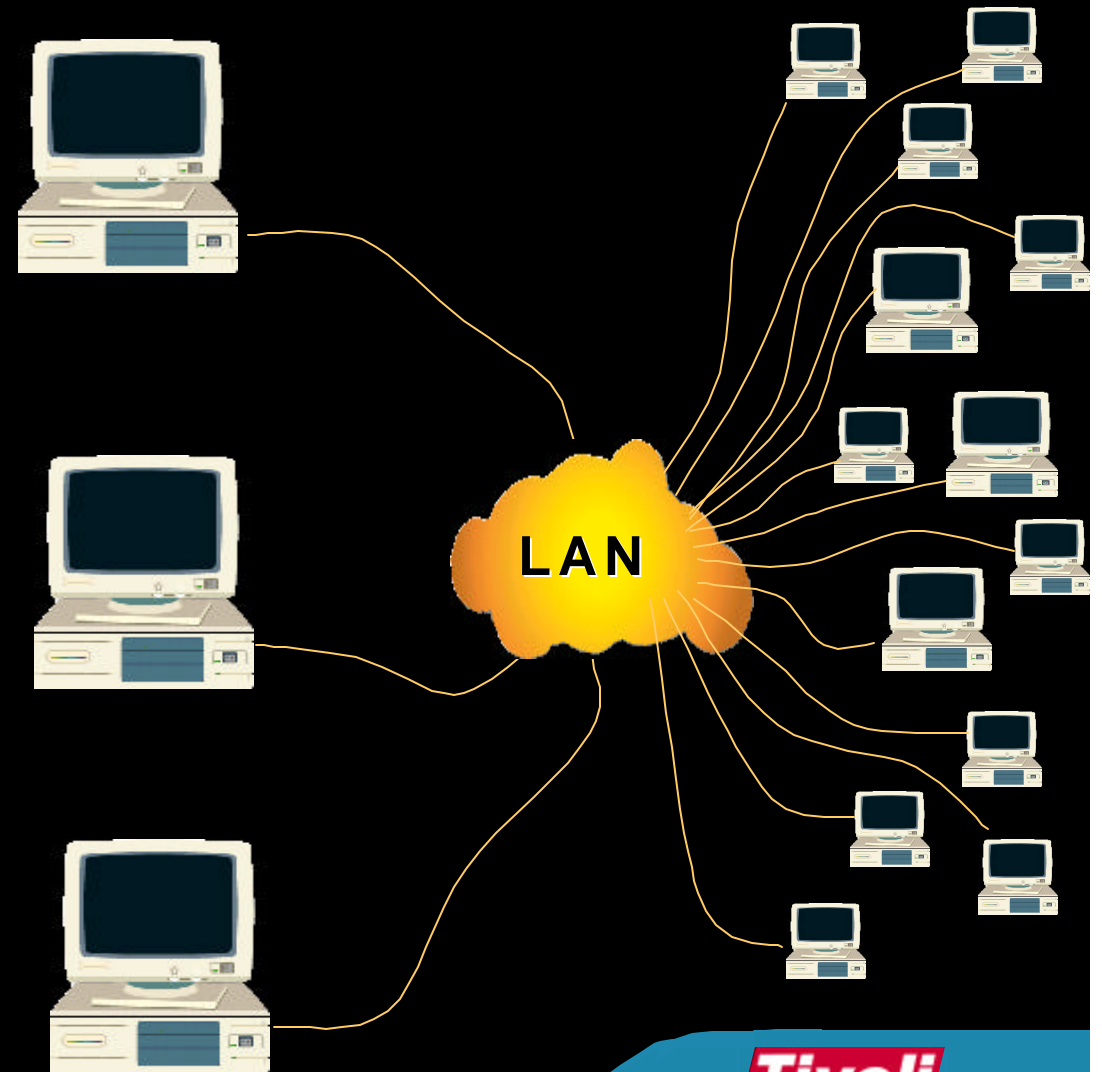
All computers using one RAID, many File Systems

3. Shared File System and (maybe) Shared Files

All computers using same RAID + File System

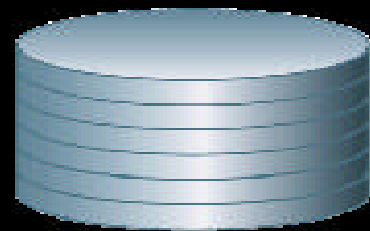
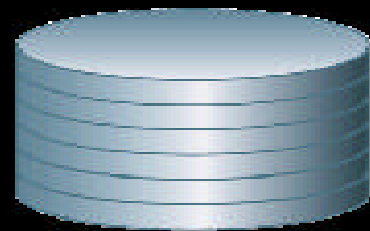
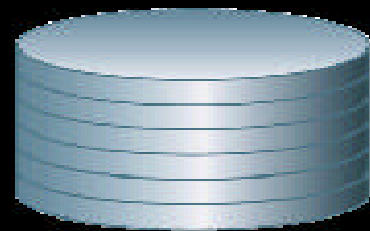
Share same Files between same Apps

What Business' have now (pre-SAN)

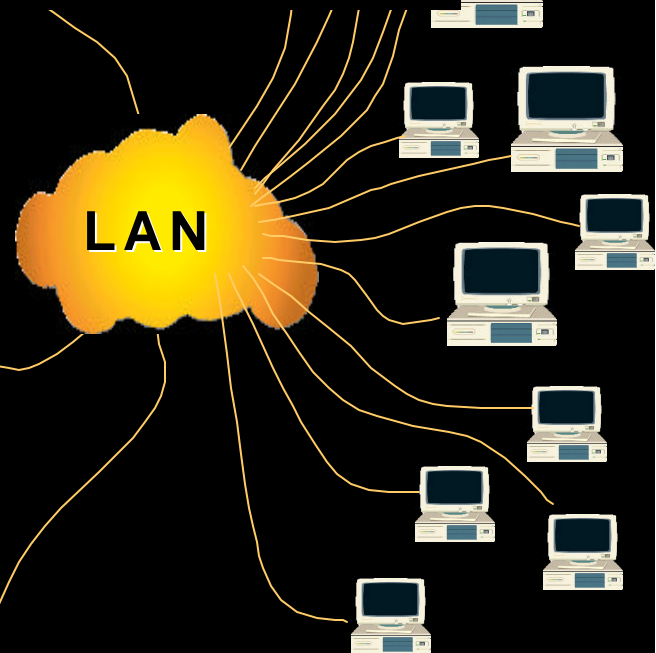


What Business' have now (pre-SAN)

Each Computer has it's own Storage Device

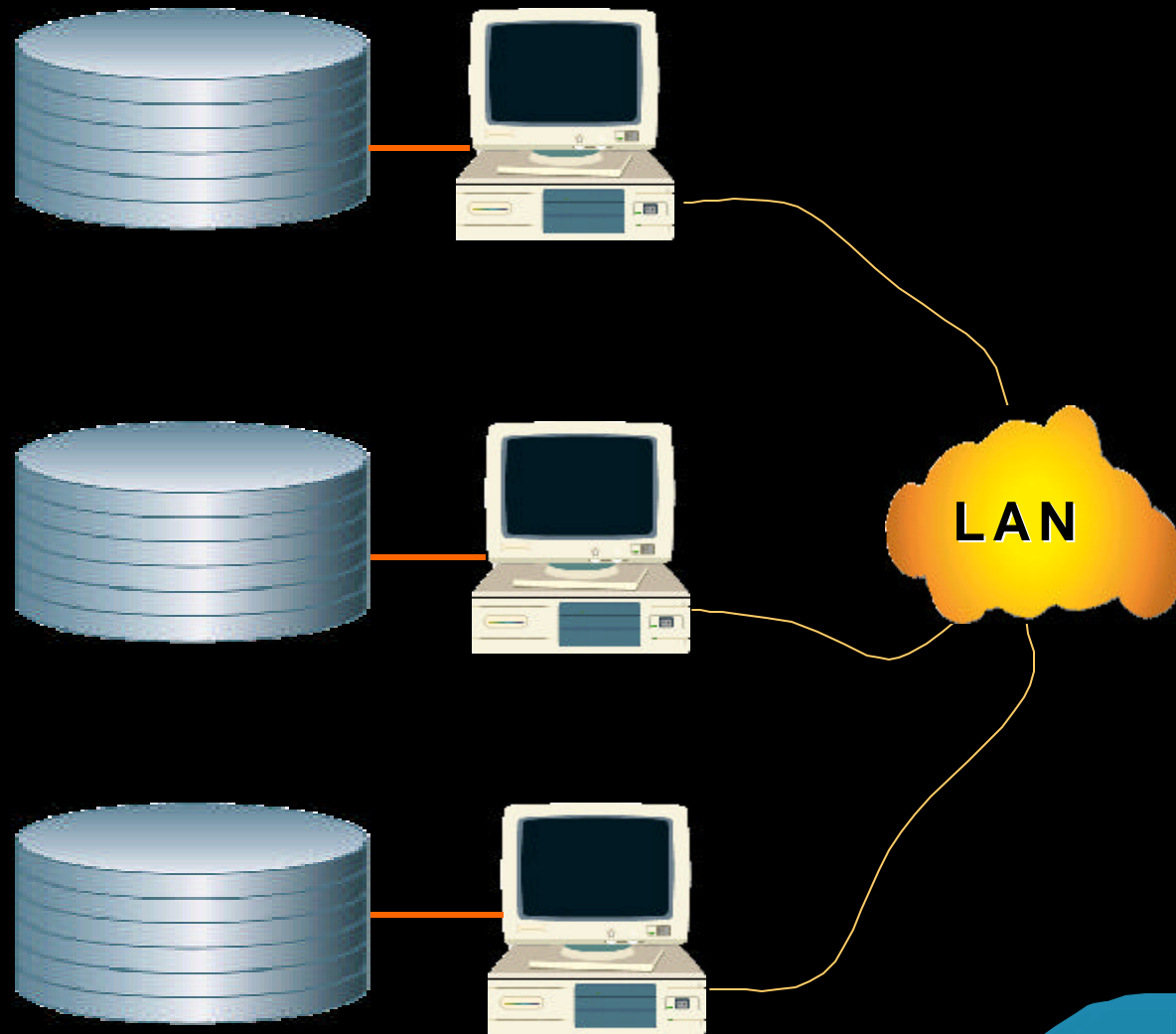


- Heterogeneous Computer Mix
- Low-Bandwidth Data Sharing



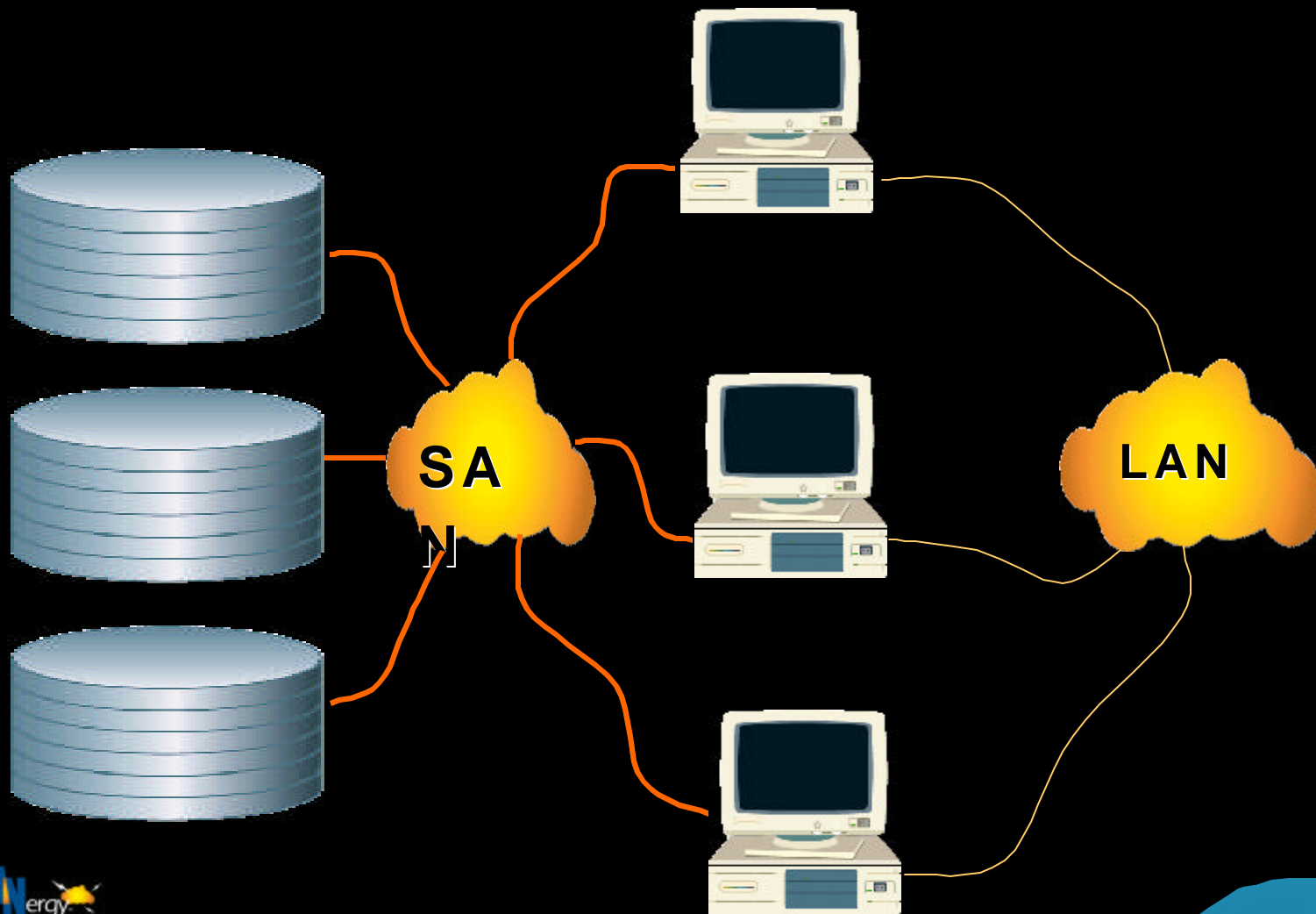
SAN Implementation #1

“Physically Consolidated Storage”



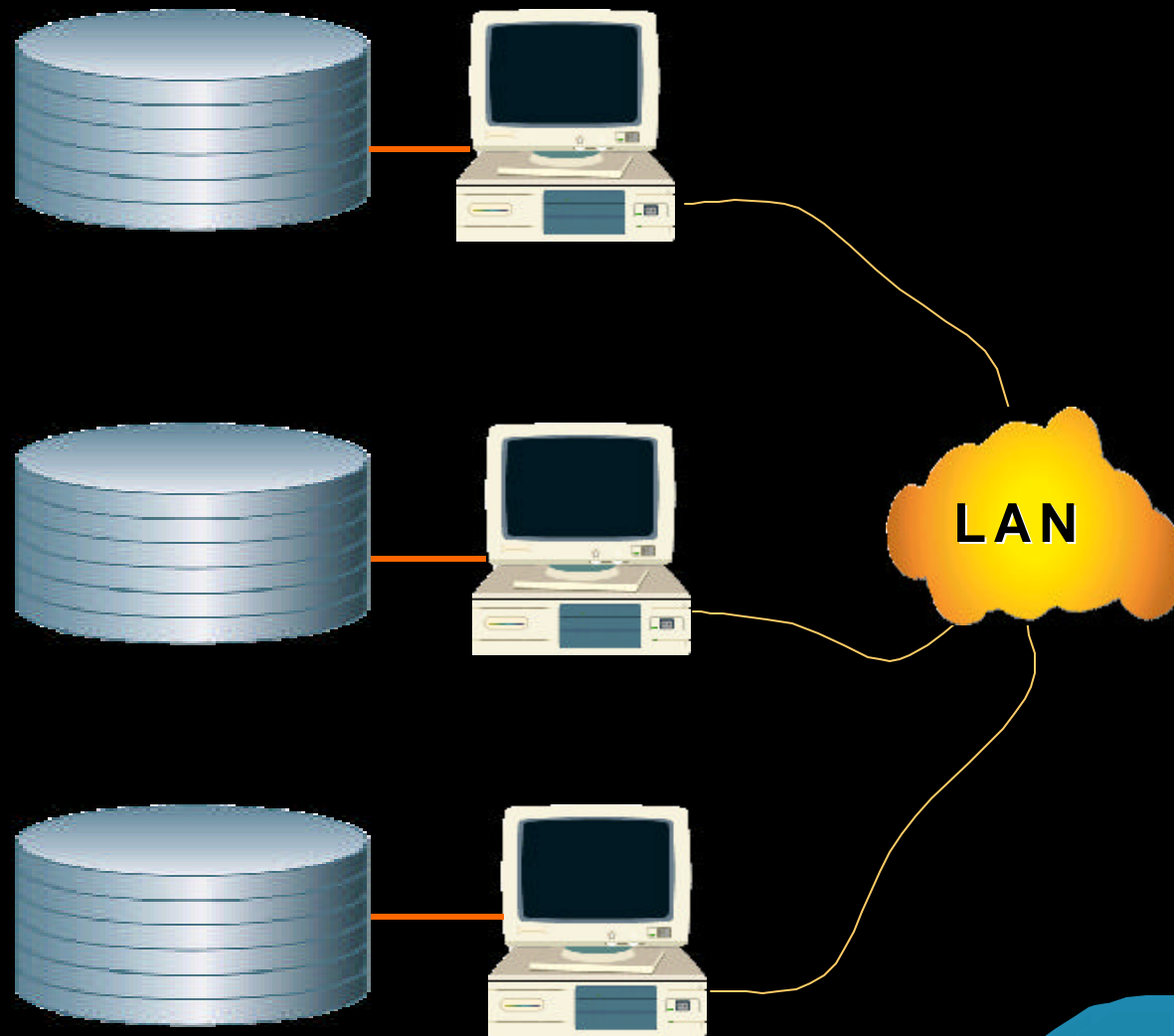
SAN Implementation #1

“Physically Consolidated Storage”



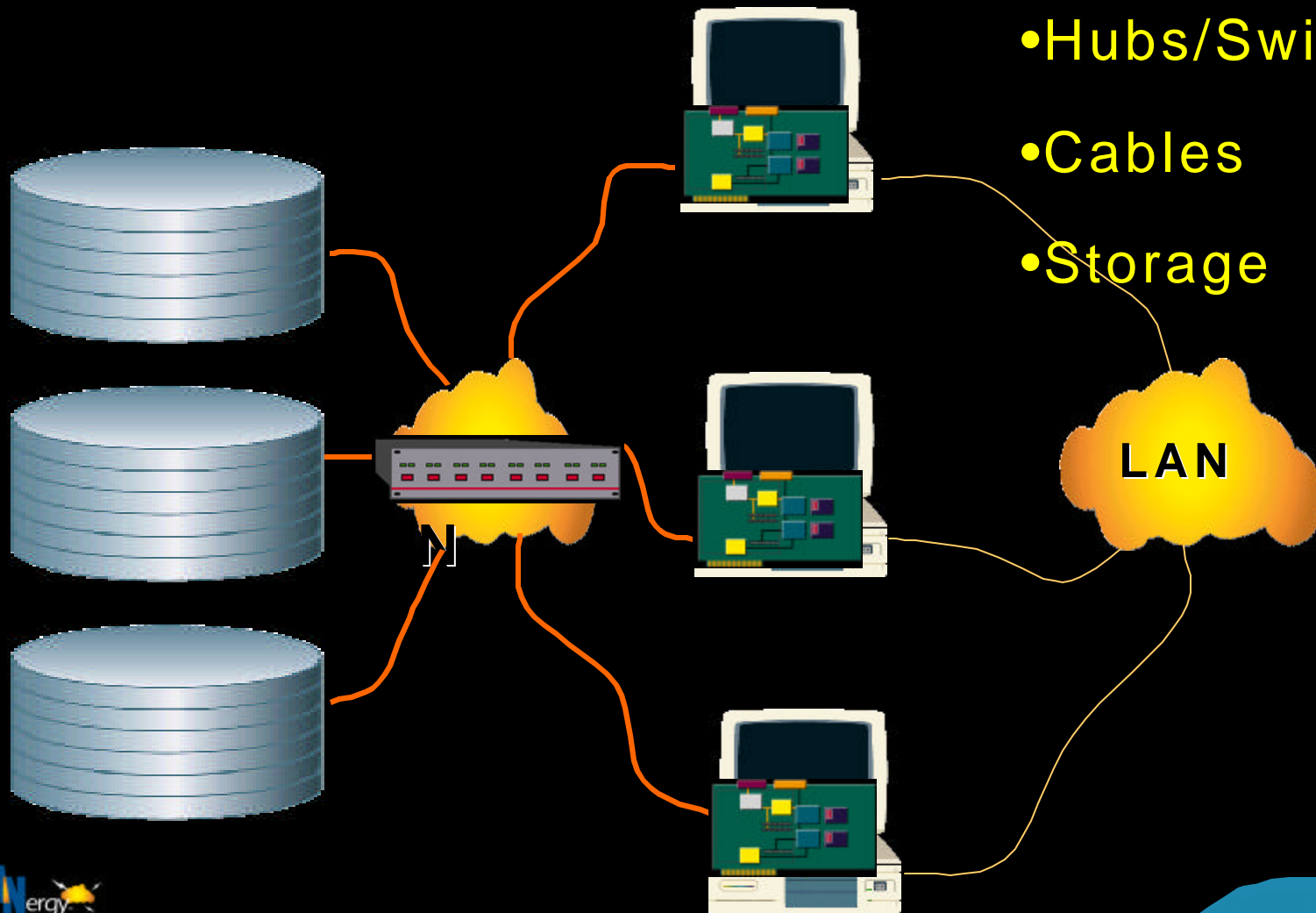
SAN Implementation #1

“Physically Consolidated Storage”



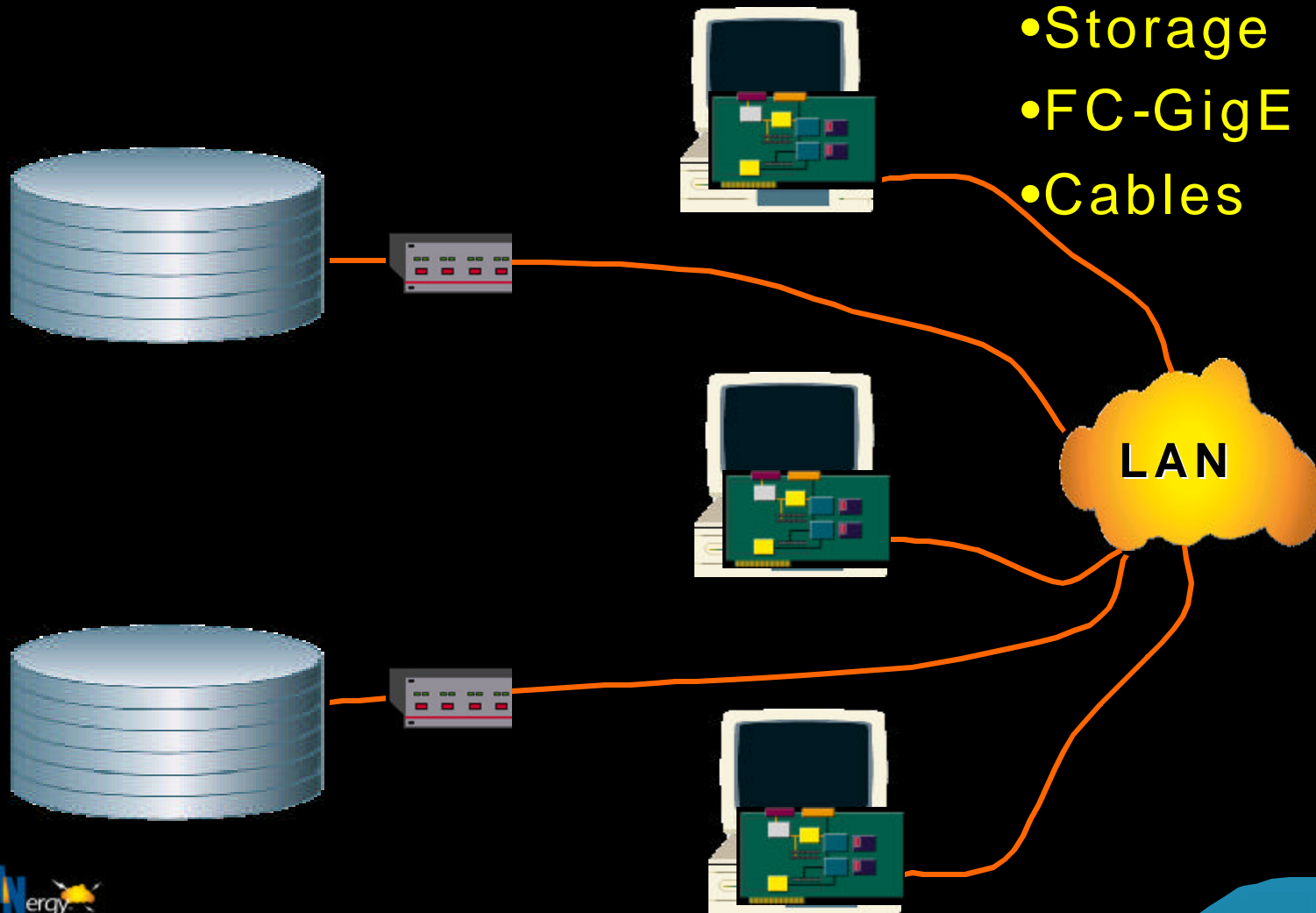
What does it take to build a SAN?

- Host Adapters (Fibre Channel)
- Hubs/Switches
- Cables
- Storage



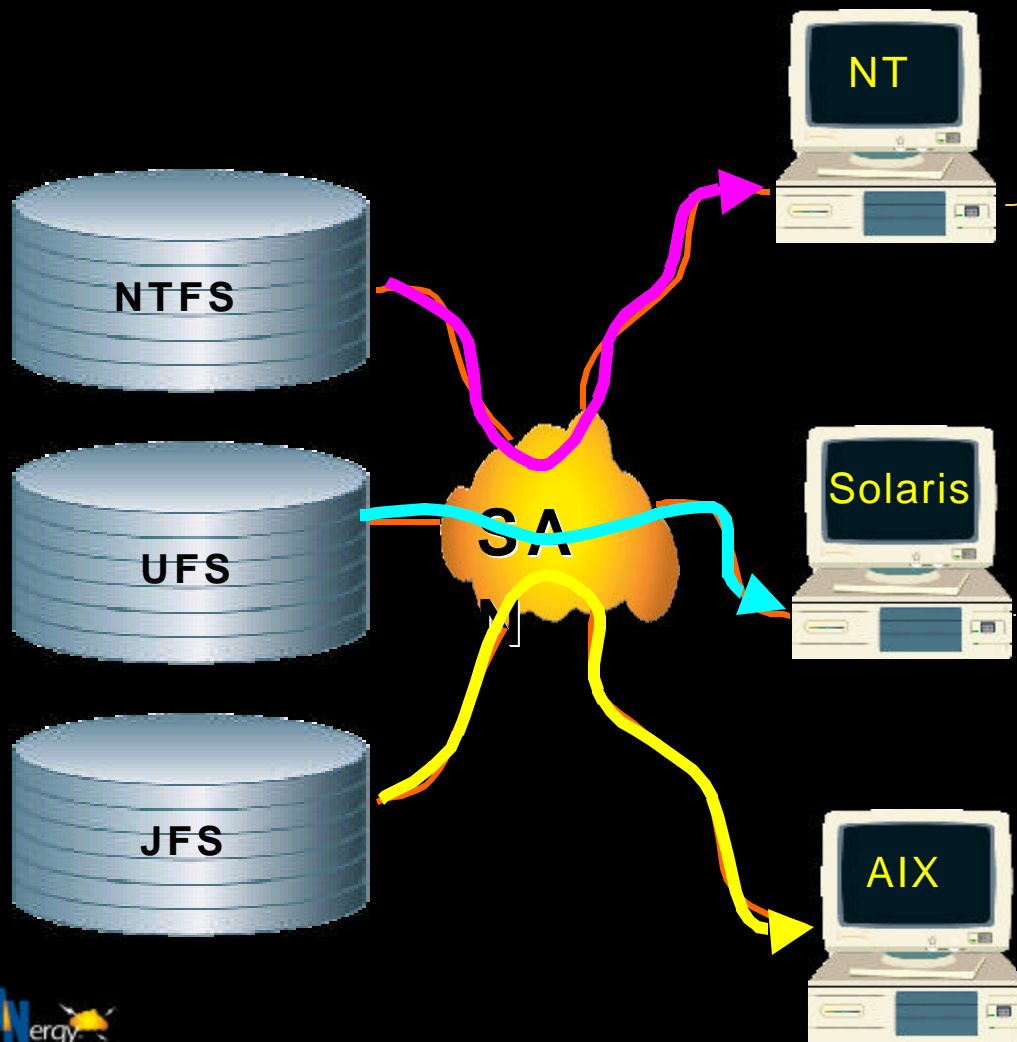
What does it take to build a SAN?

- NICs (GigE)
- Hubs/Switches
- Storage
- FC-GigE I/F
- Cables



SAN Implementation #1

“Physically Consolidated Storage”

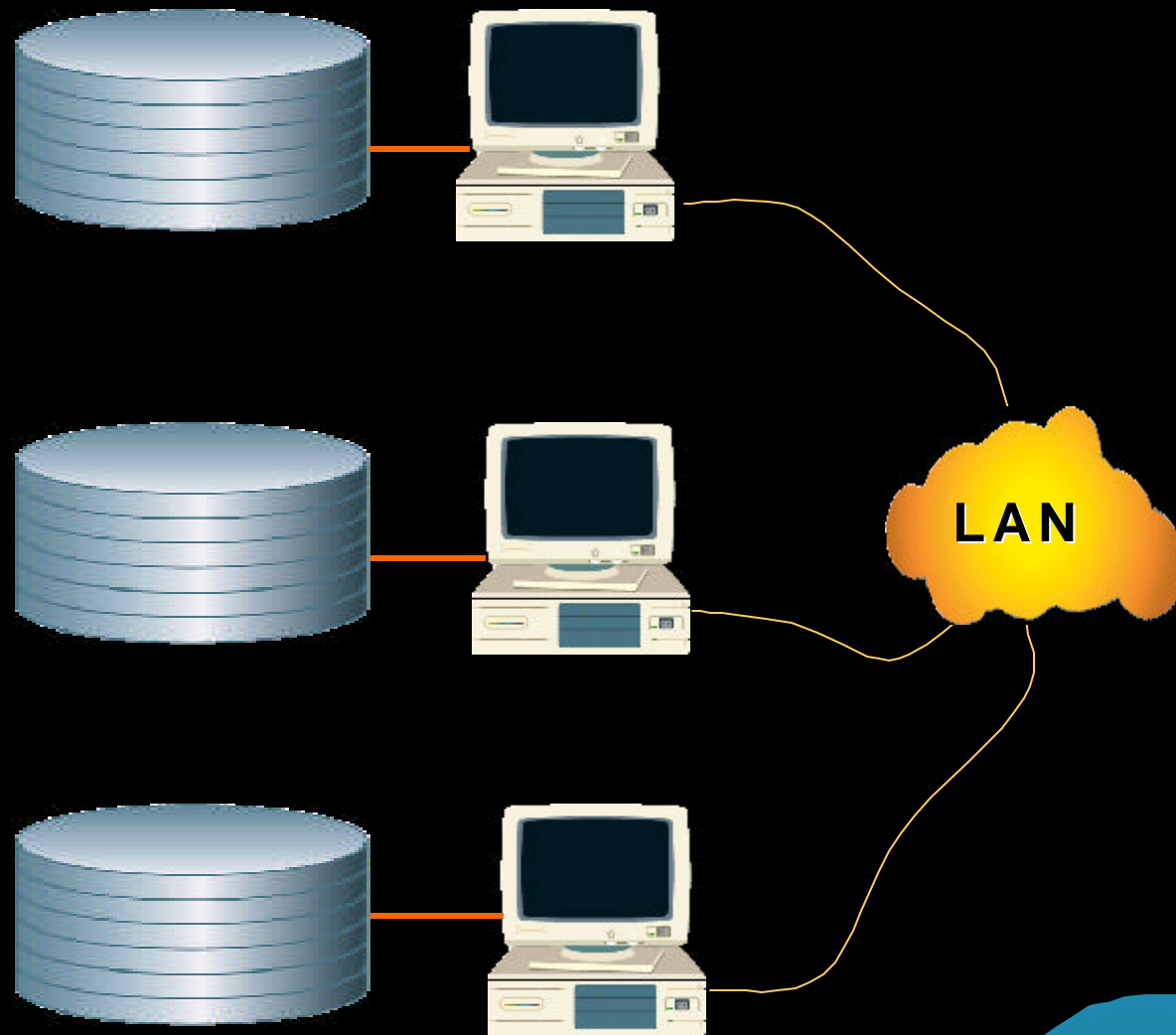


- Zoned Hub/Switch
- Format in various FS

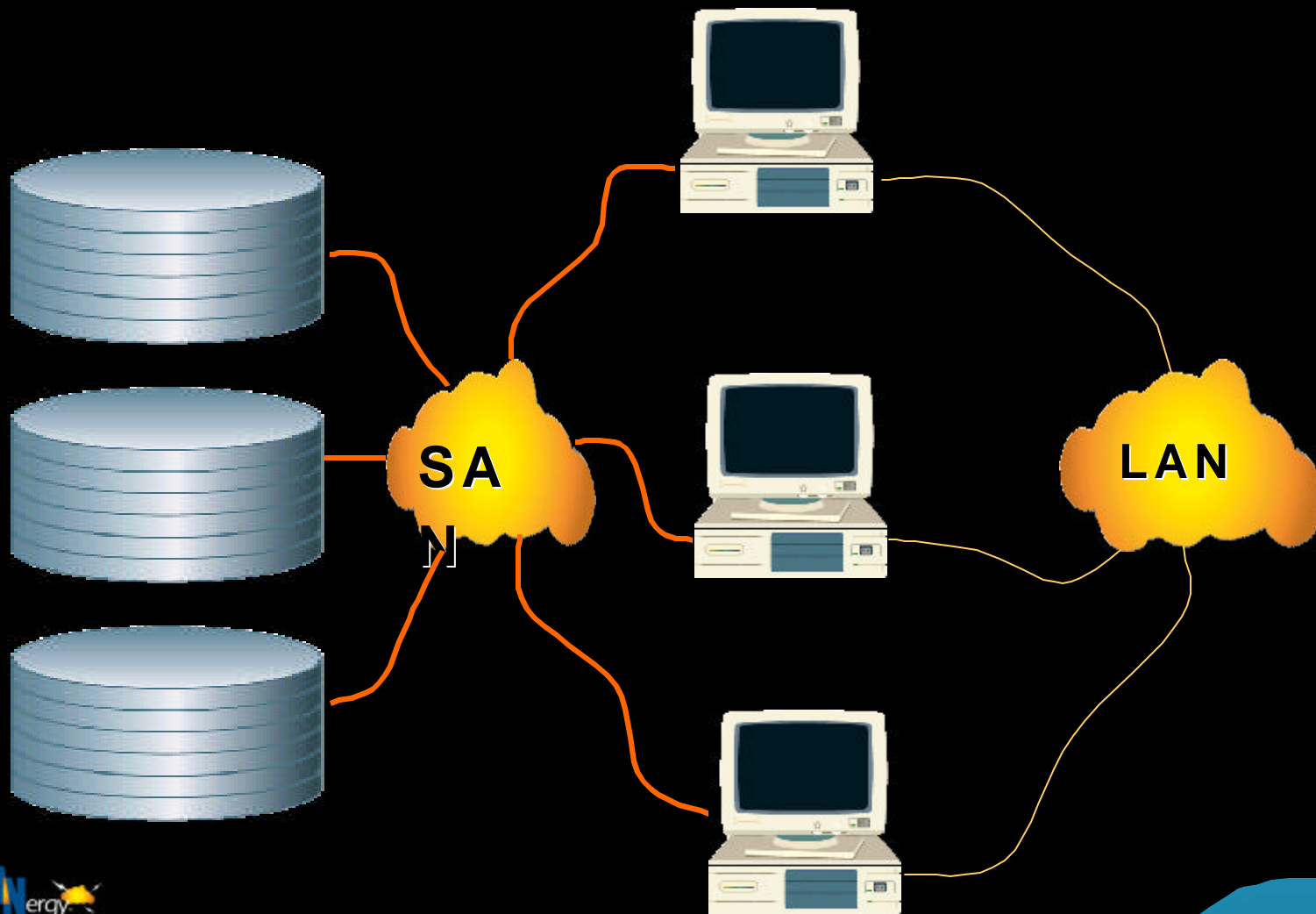
Benefits

- Centrally located
- Centrally administer
- Separates Storage from Processors

SAN Implementation #2

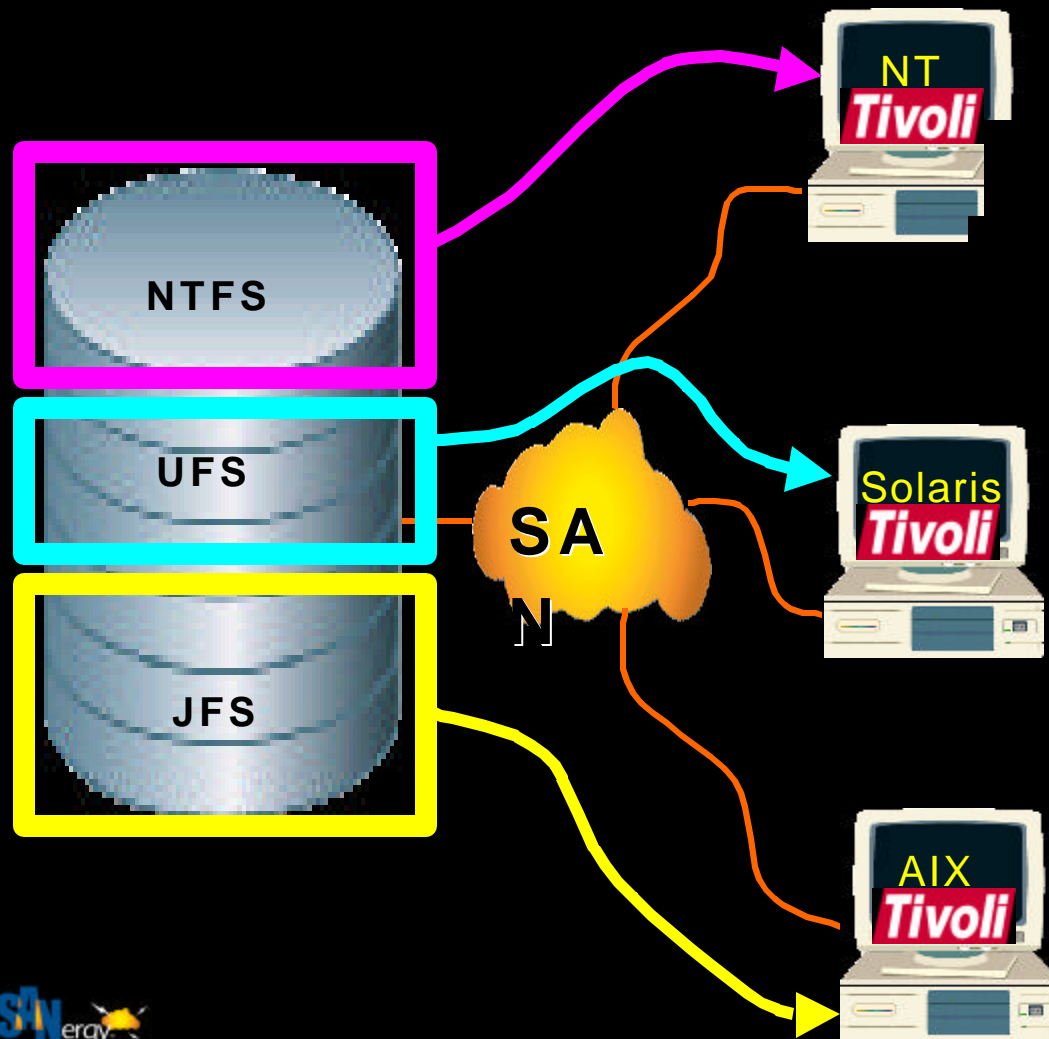


SAN Implementation #2



SAN Implementation #2

“Partitioned, LUN Masked RAID”



- Install LUN-Manager
- Divide storage
- Assign Pieces
- Format in various FS

Benefits

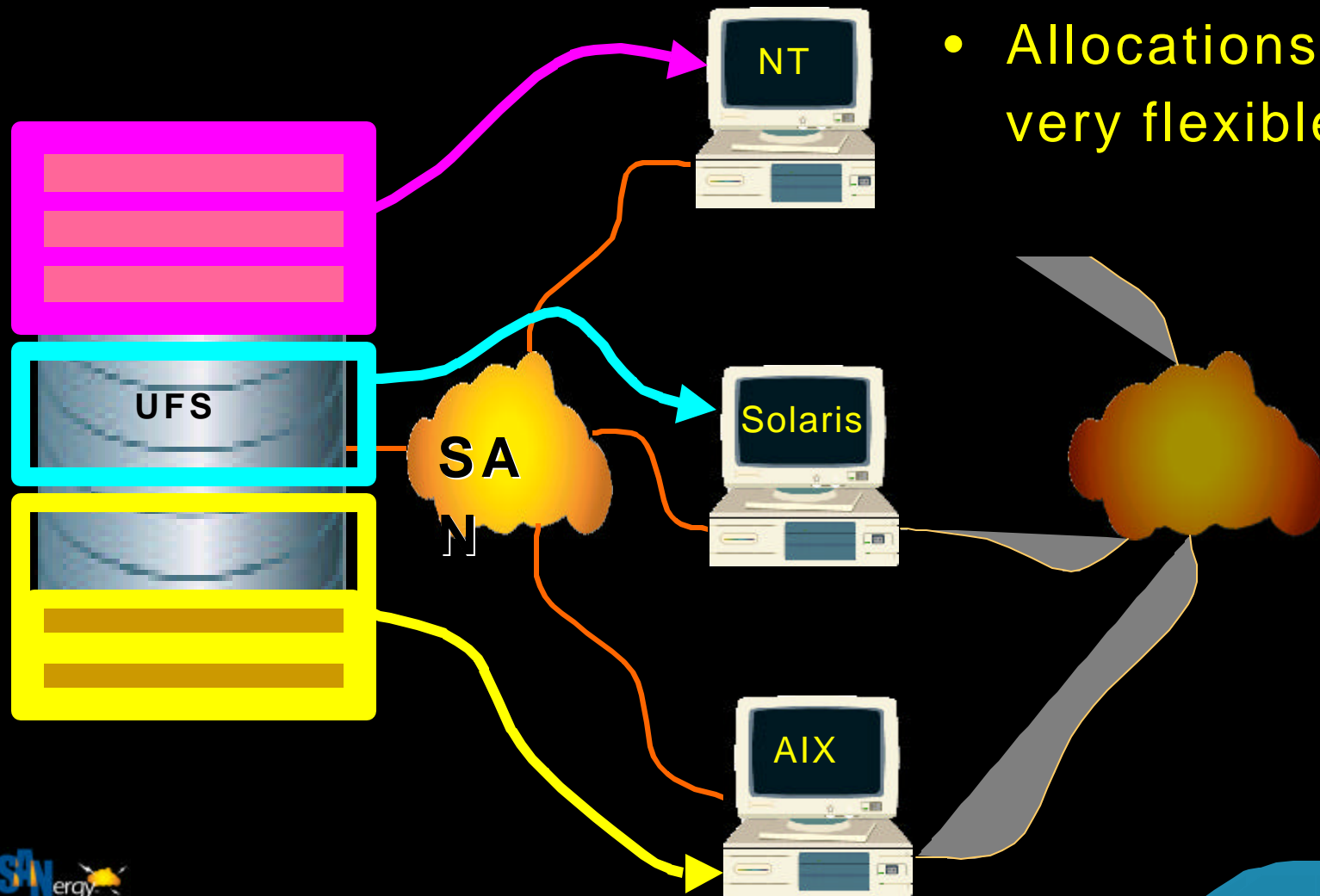
- Centrally Located + Administered
- Increased Storage Reliability with RAID
- Amortized RAID expense

SAN Implementation #2

“Partitioned, LUN Masked RAID”

CONs

- Allocations not very flexible

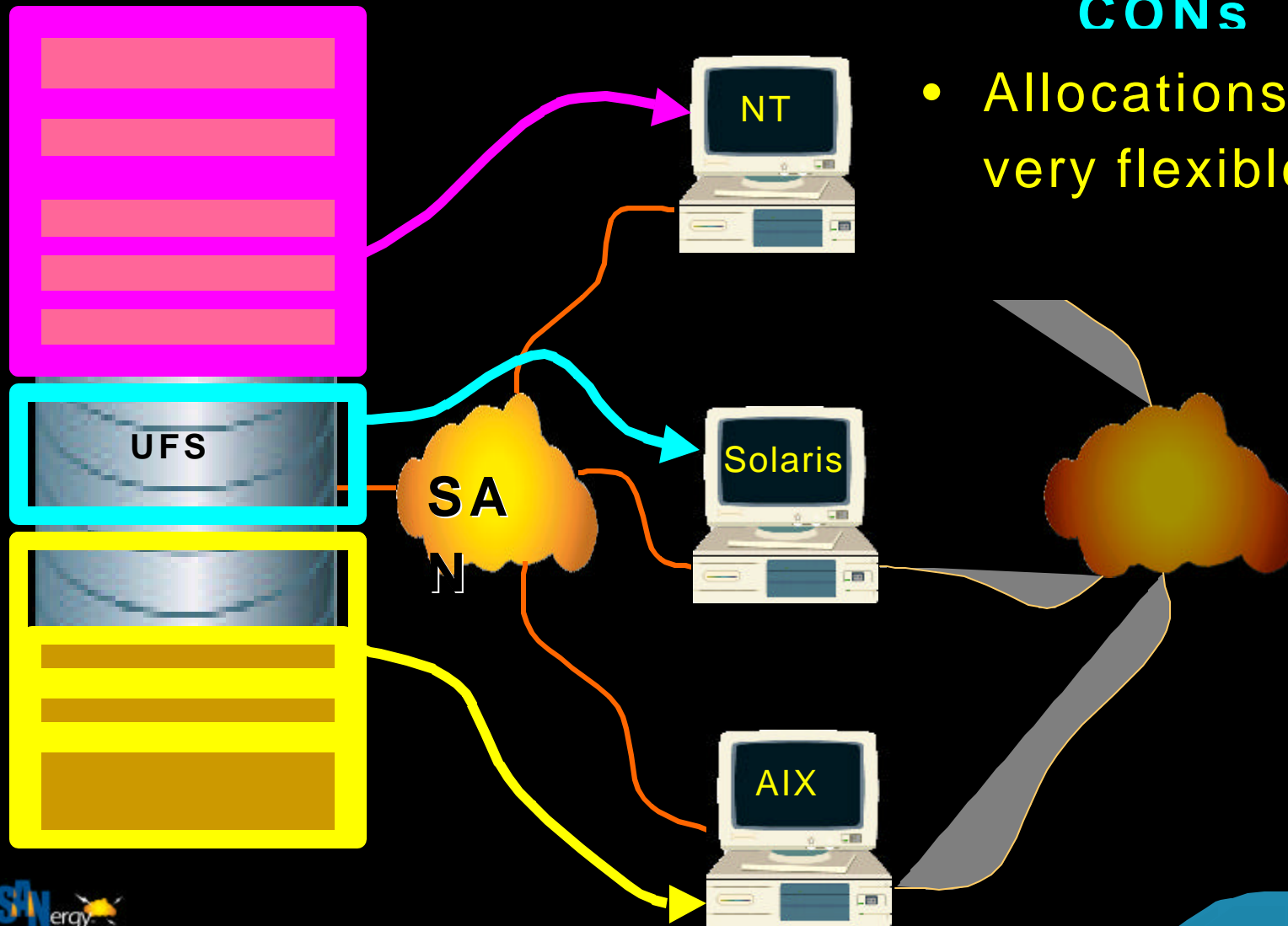


SAN Implementation #2

“Partitioned, LUN Masked RAID”

CONs

- Allocations not very flexible

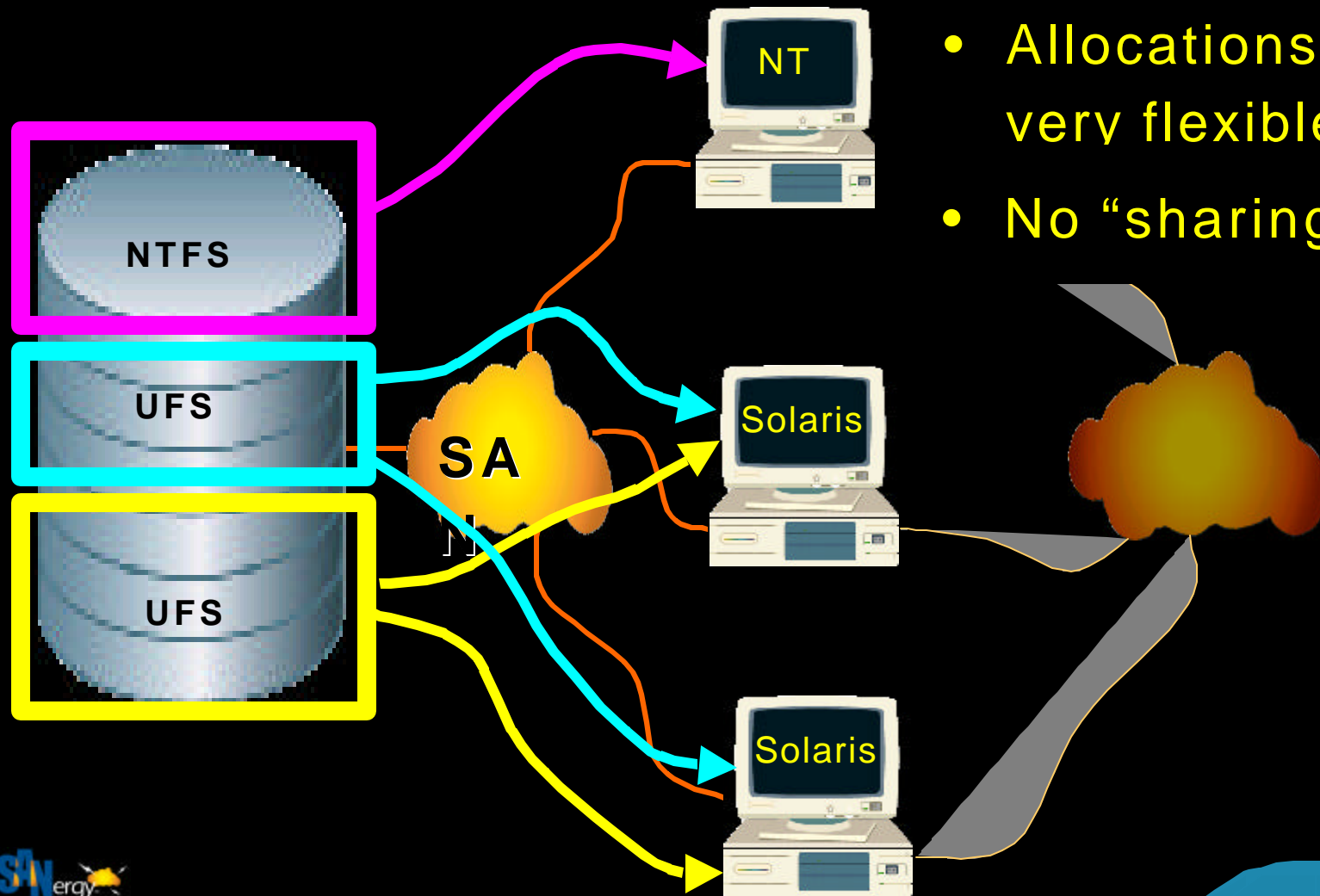


SAN Implementation #2

“Partitioned, LUN Masked RAID”

CONs

- Allocations not very flexible
- No “sharing”

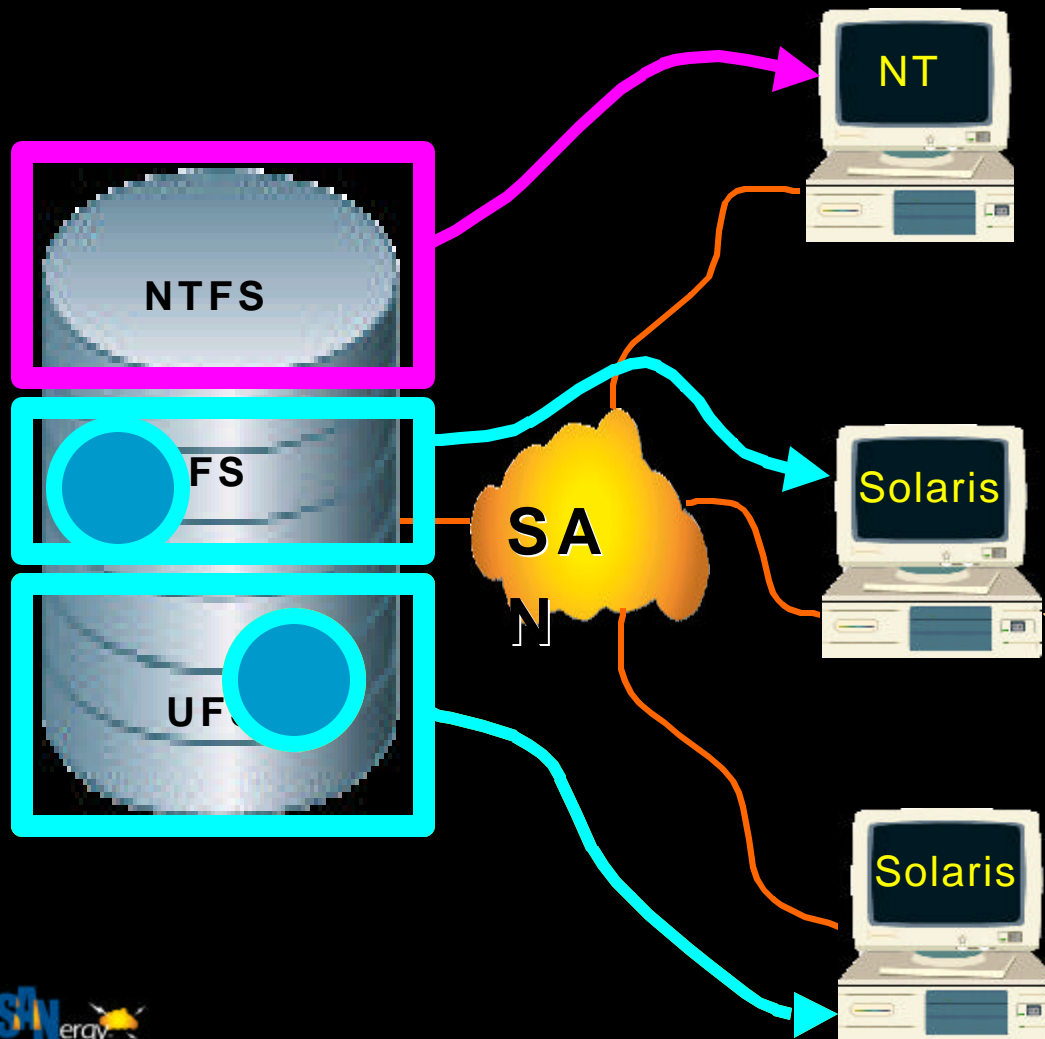


SAN Implementation #2

“Partitioned, LUN Masked RAID”

CONs

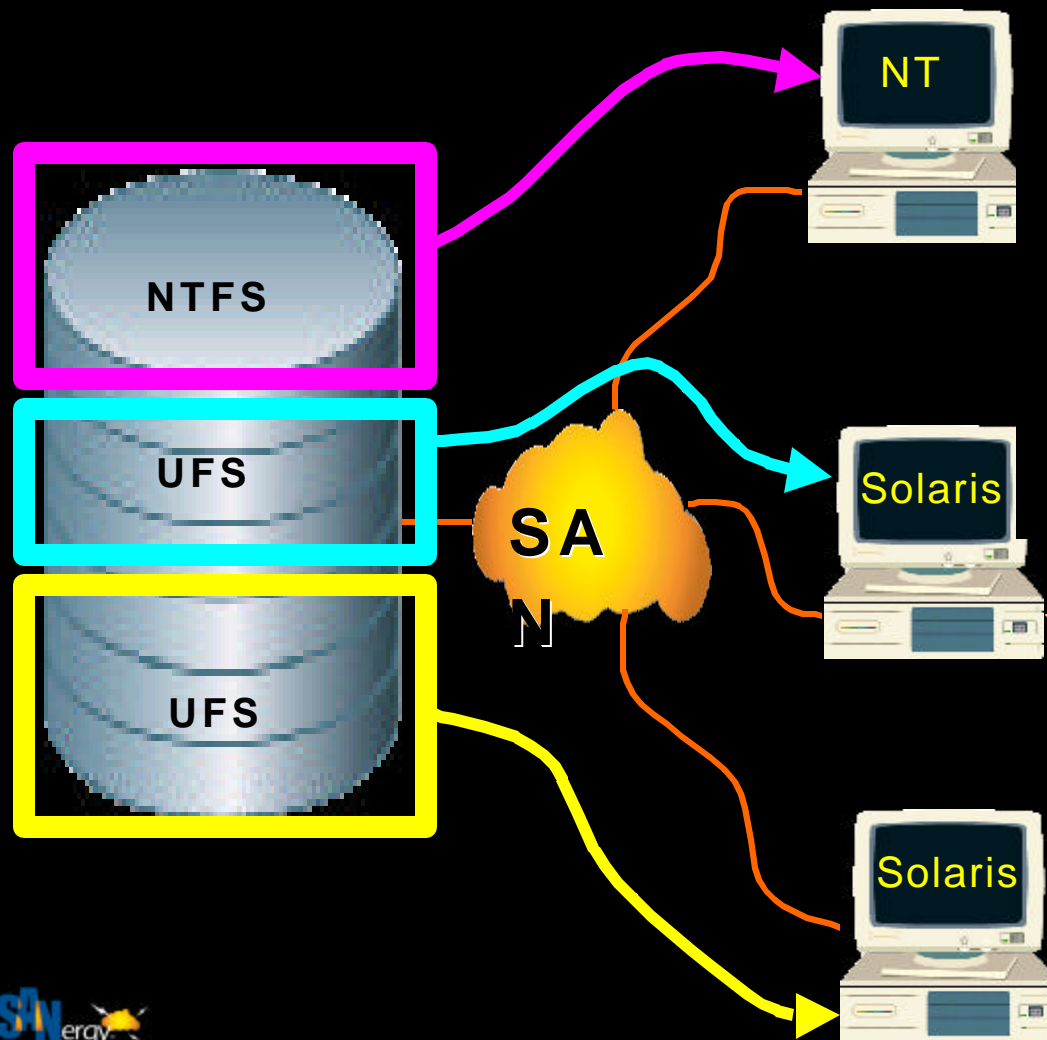
- Allocations not very flexible
- No “sharing”
- Multiple data copies



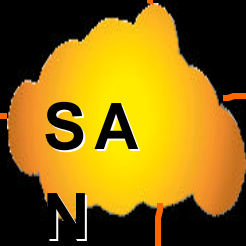
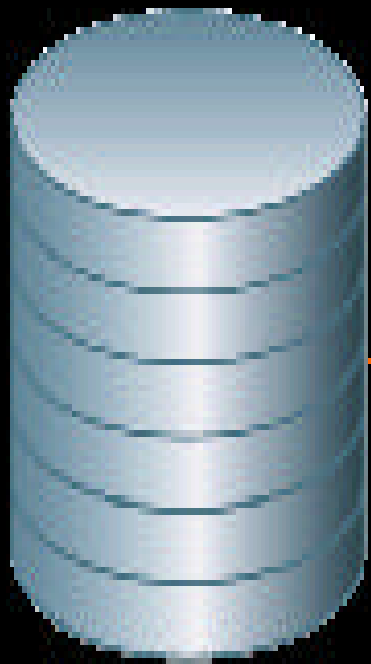
SAN Implementation #2

“Partitioned, LUN Masked RAID”

CONs

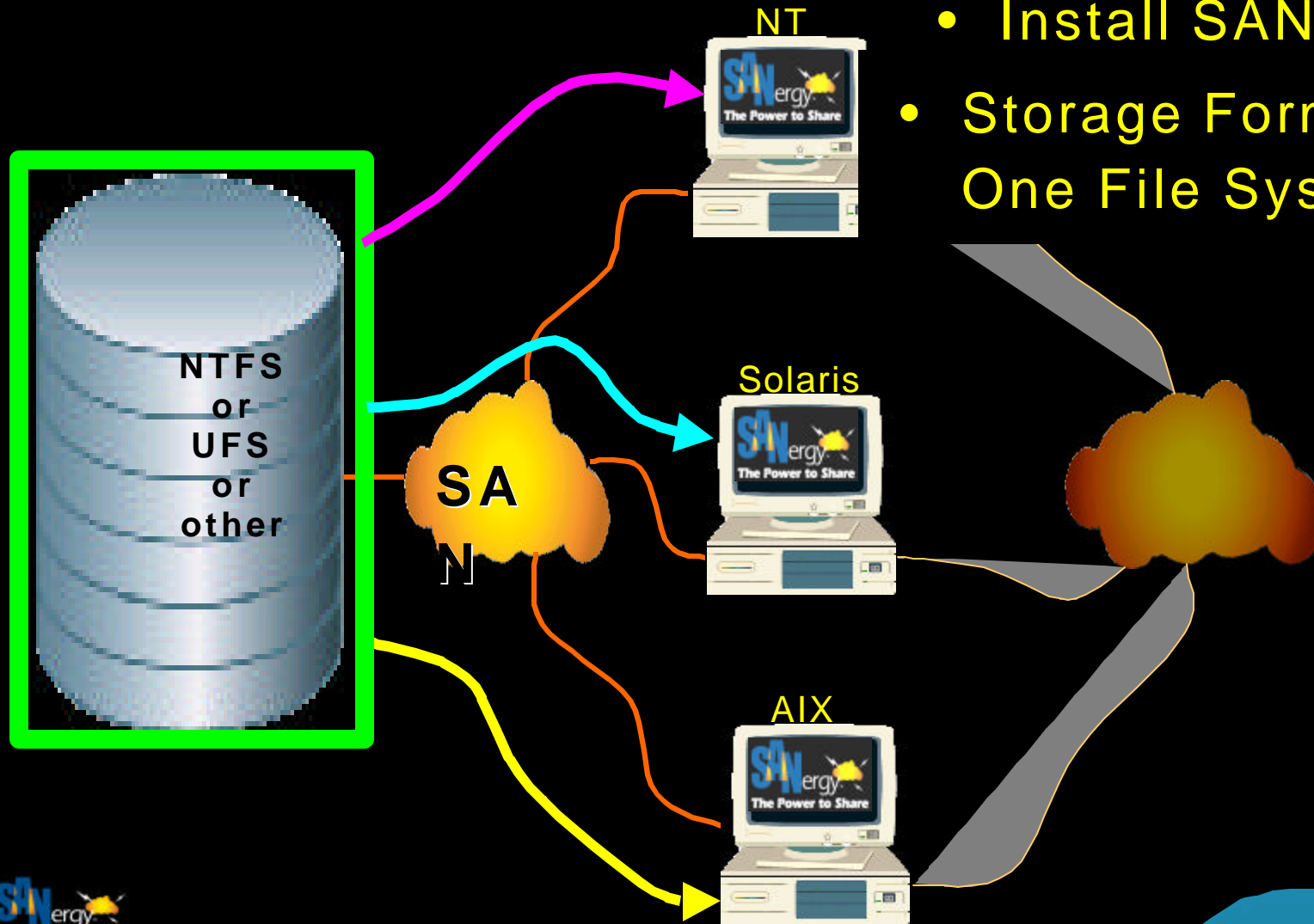


- Allocations not very flexible
- No “sharing”
- Multiple data copies
- Multiple File Systems
- One to One Partition - Computer



SAN Implementation #3 “Shared File System”

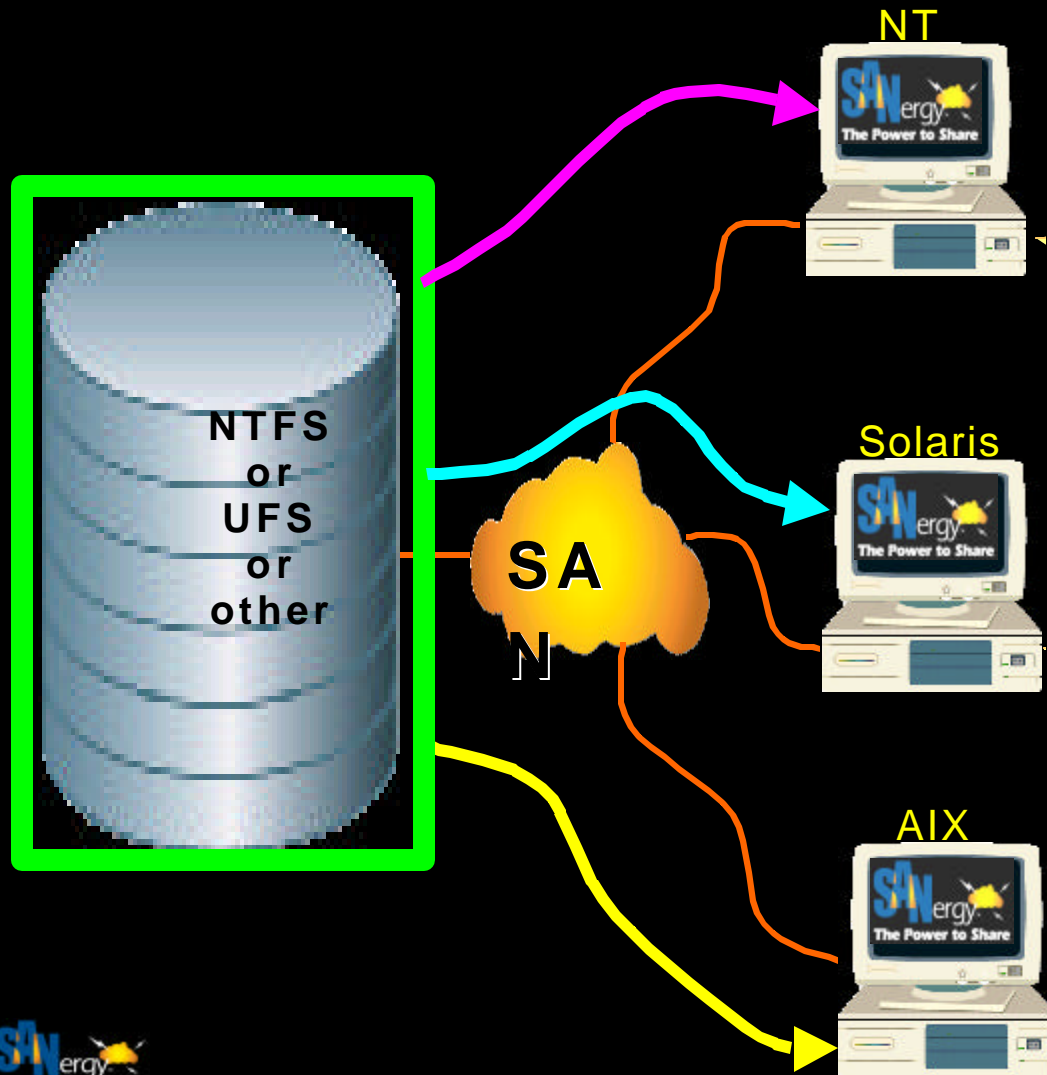
- Install SANergy
- Storage Formatted with One File System



SAN Implementation #3 “Shared File System”

Benefits

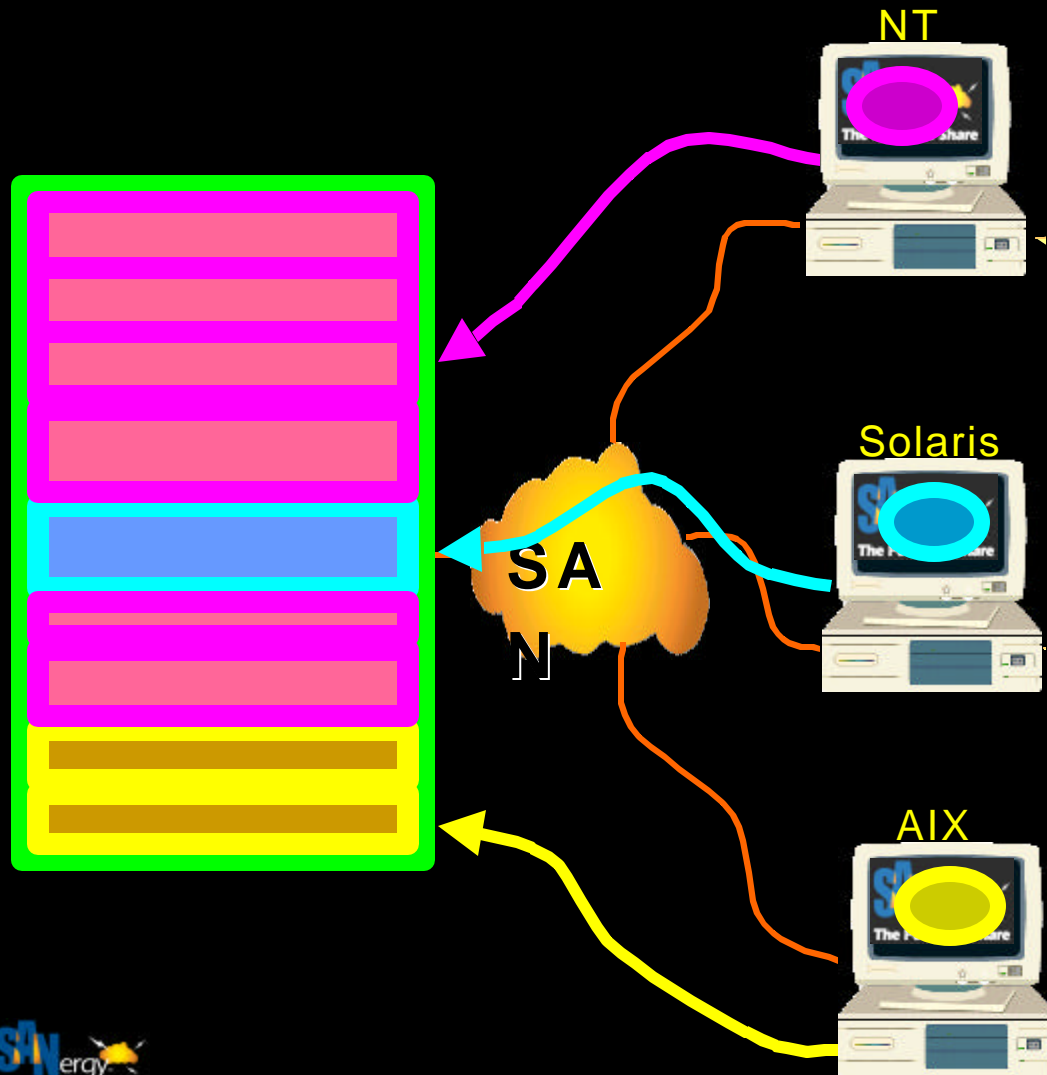
- Centrally Located + Administered
- Increased Reliability with RAID
- Amortized RAID expense
- Only One File System to Manage
- Flex - Data Growth - less rebuilding



SAN Implementation #3 “Shared File System”

Benefits

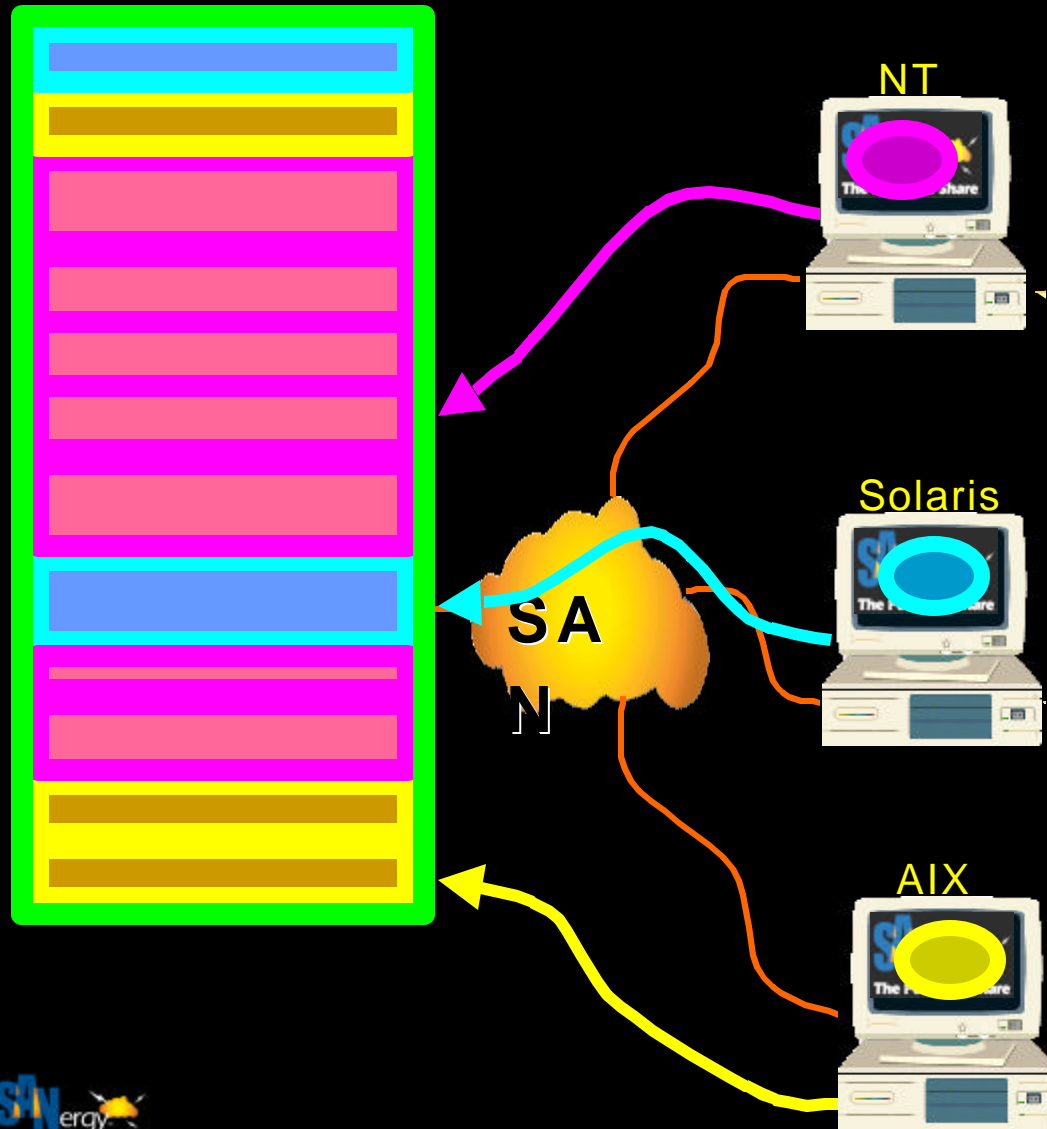
- Centrally Located + Administered
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SAN Implementation #3 “Shared File System”

Benefits

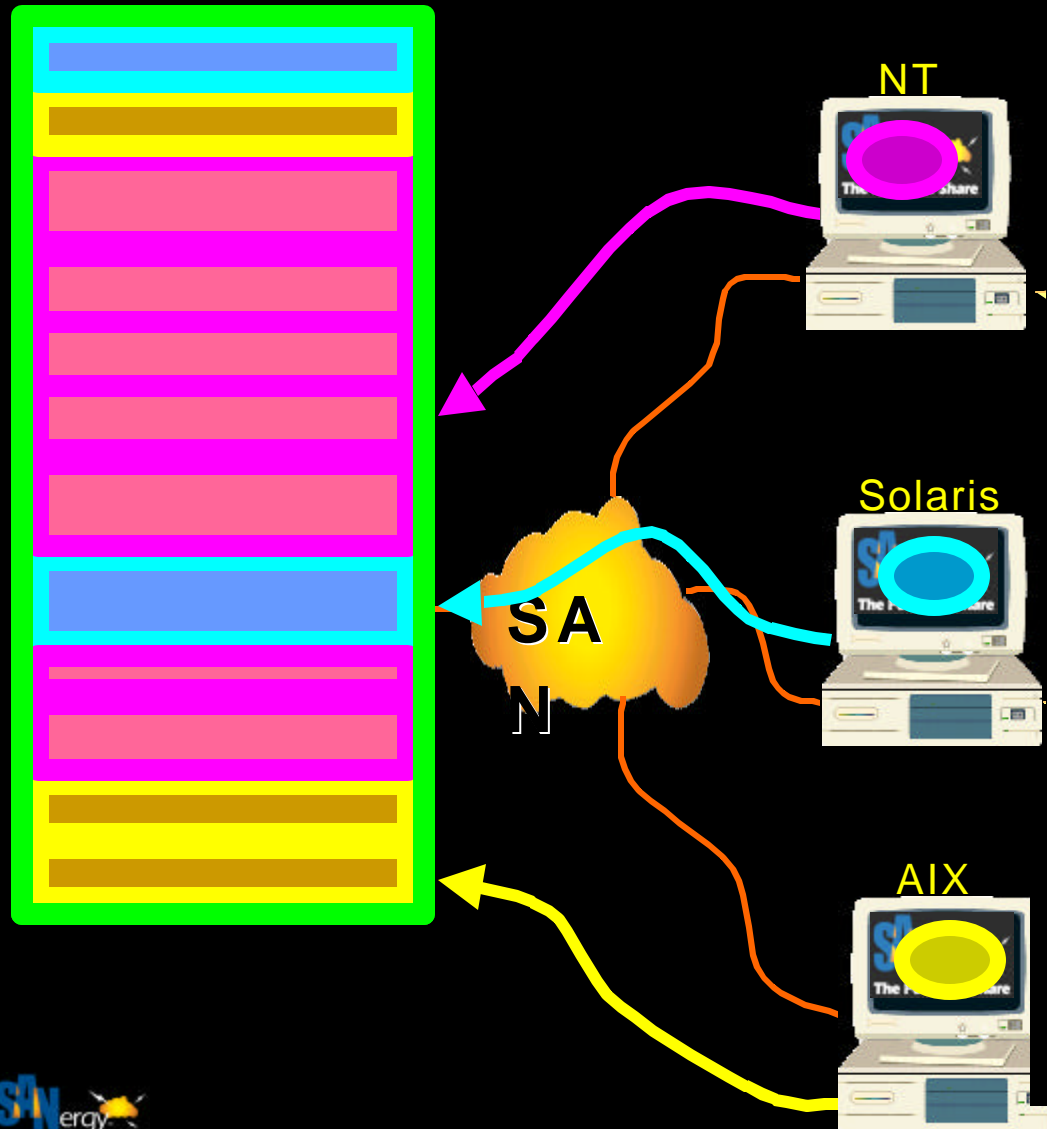
- Centrally Located + Administered
- Increased Reliability with RAID
- Amortized RAID expense
- Only One File System to Manage
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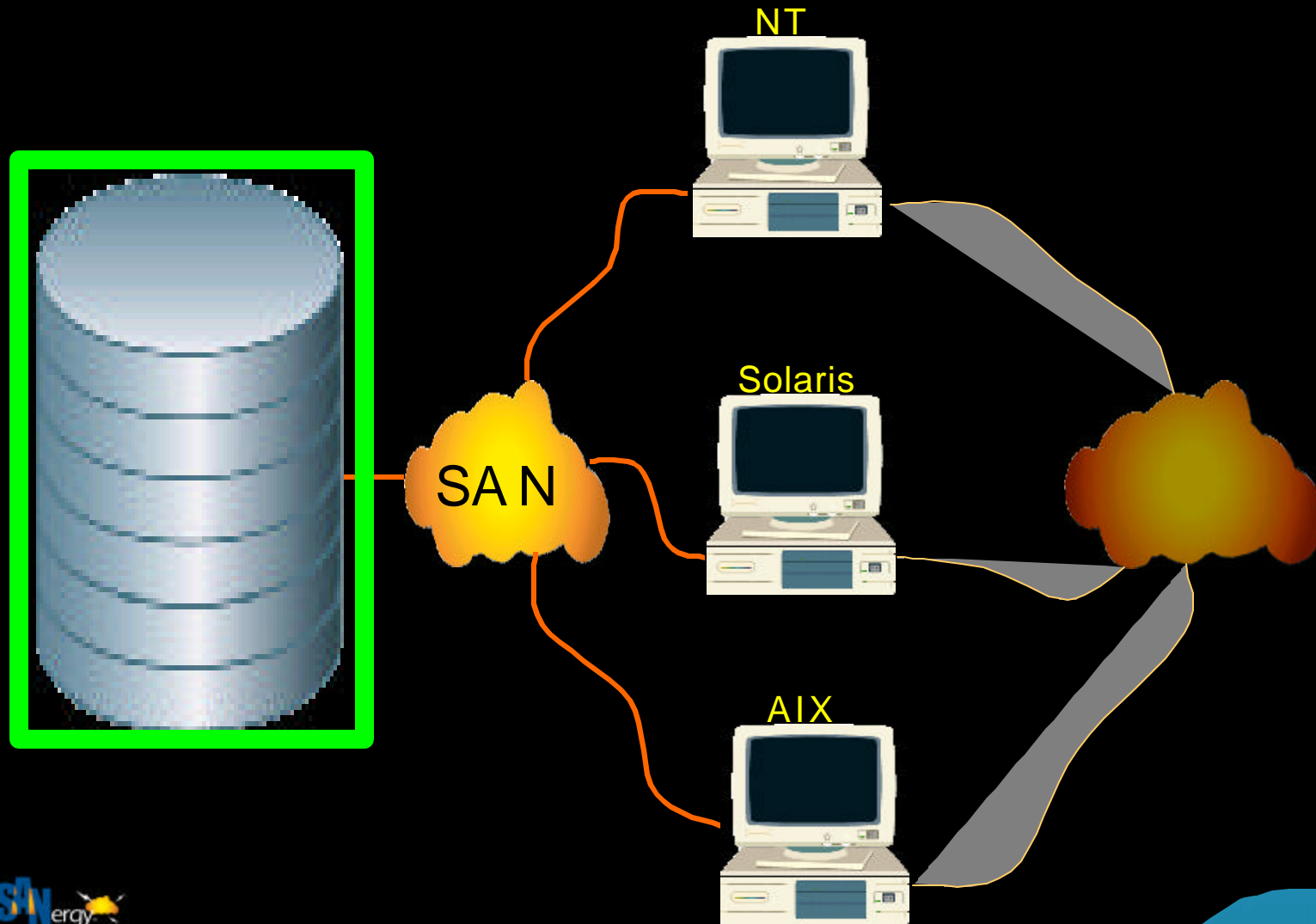
SAN Implementation #3 “Shared File System”

Benefits

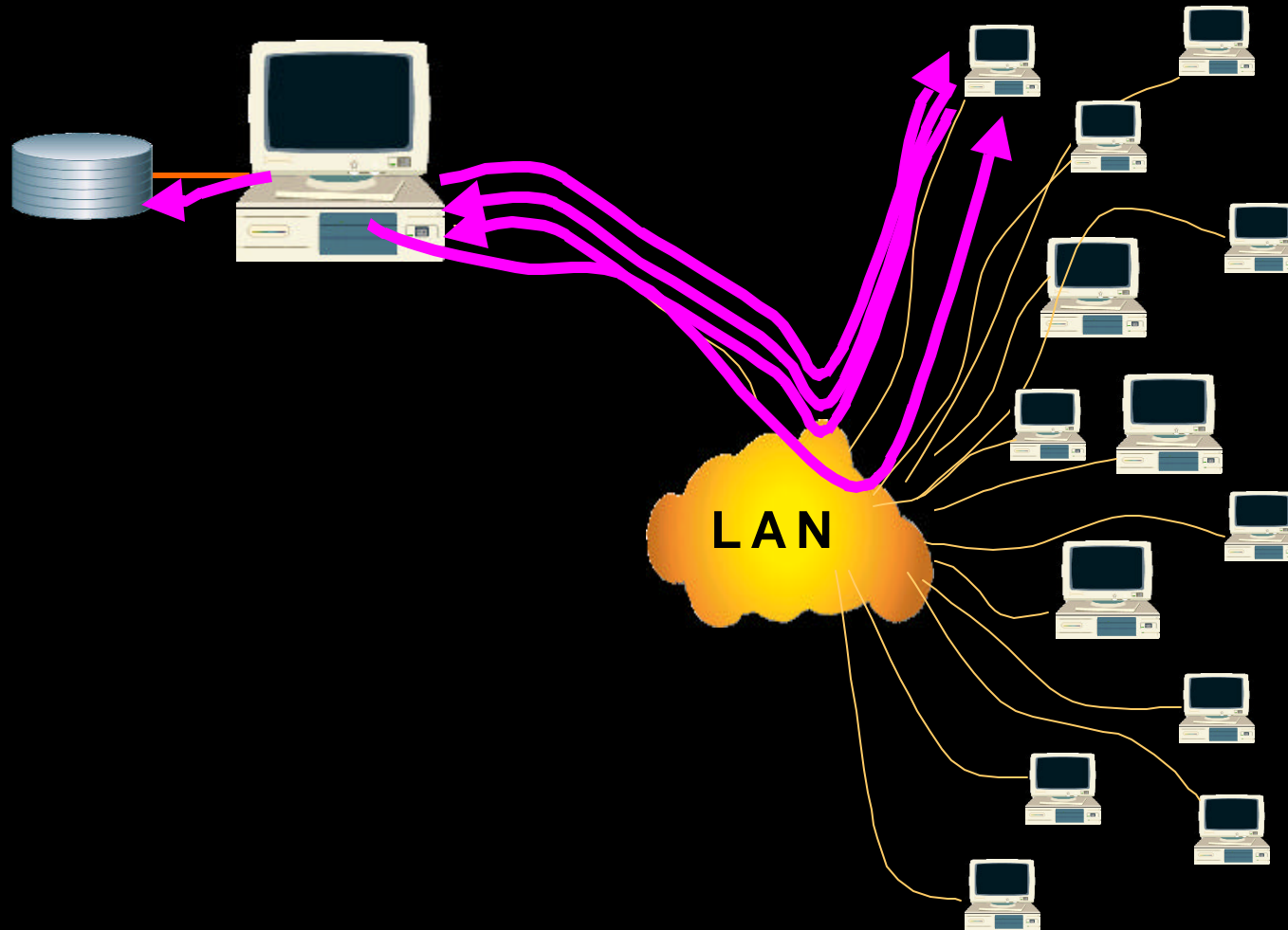
- Centrally Located + Administered
- Increased Reliability with RAID
- Amortized RAID expense
- Only One File System to Manage
- Flex - Data Growth - less rebuilding
- One to Many Partition - Computer



Can the SAN “Share Files”?



How do LANs and Servers work?

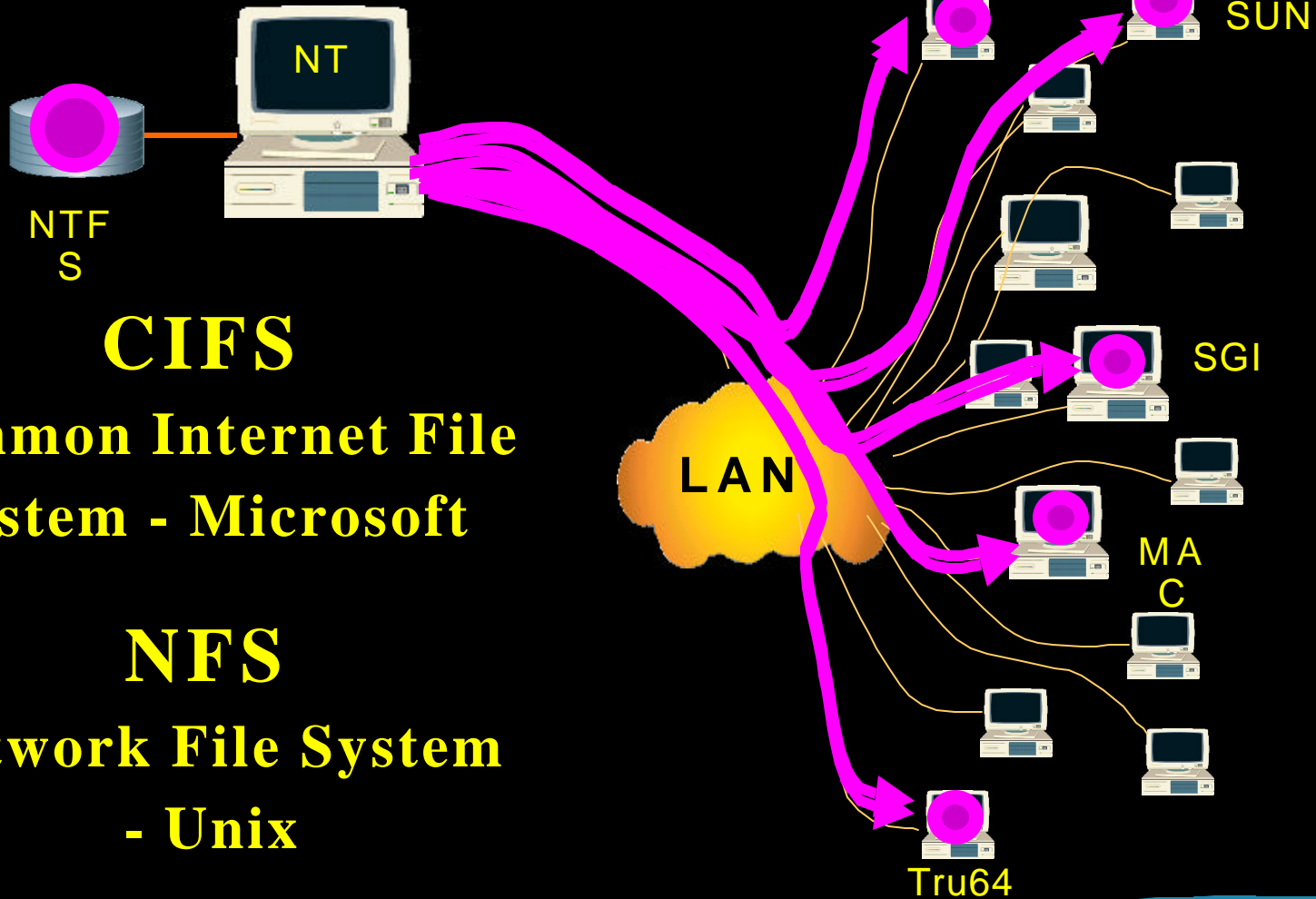


Do Servers "Share"?

NT serving Windows clients

NT serving Unix and other clients

NFS Server software - Hummingbird



CIFS

Common Internet File System - Microsoft

NFS

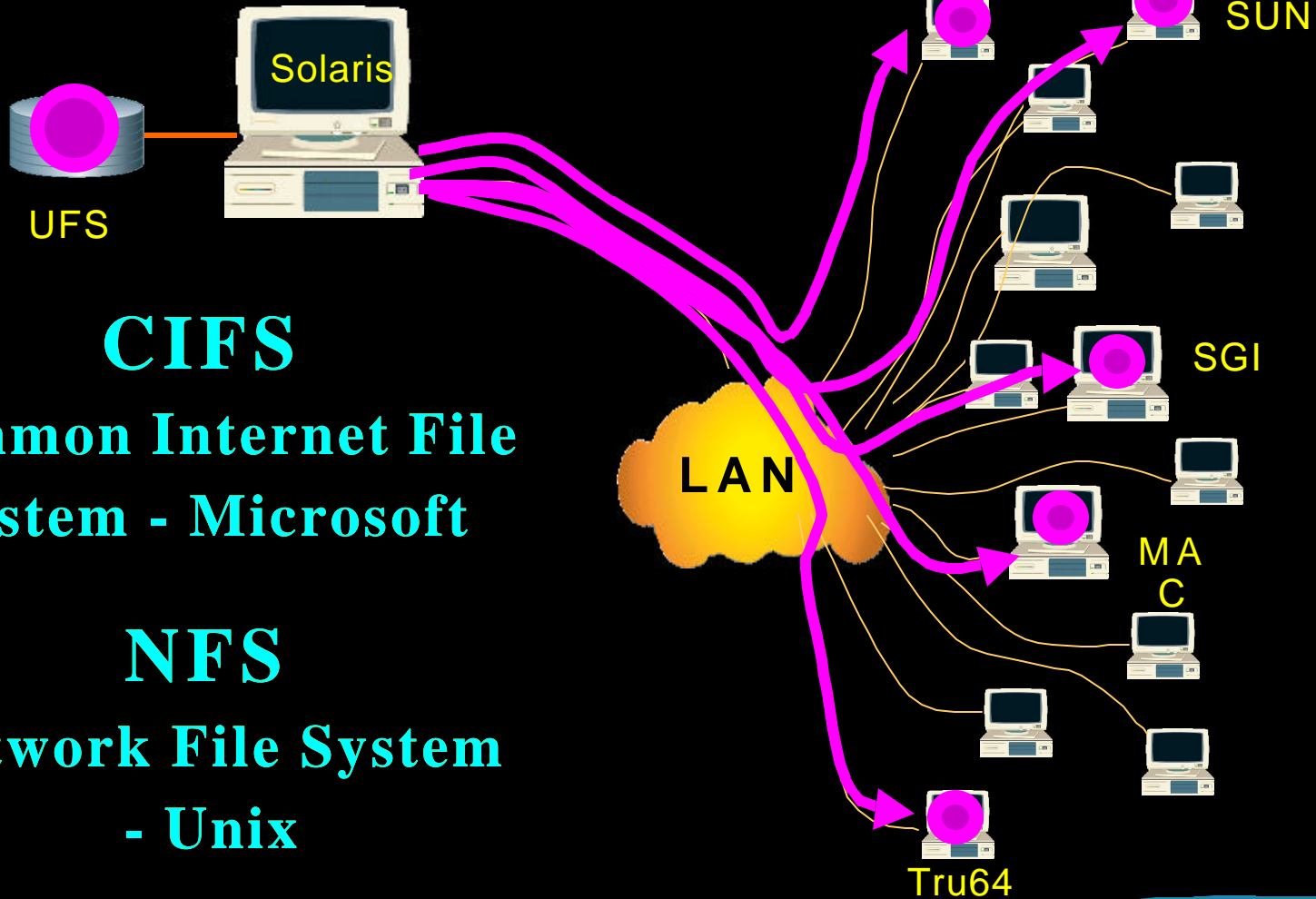
Network File System - Unix

Do Servers "Share"?

Unix serving Unix clients

Unix serving NT clients

CIFS Server software - Samba



CIFS
Common Internet File
System - Microsoft

NFS
Network File System
- Unix



My Computer



Get QuickTime Pro



Network Neighborhood



Shortcut to Tpn



Microsoft Outlook



QuickTime Player



Internet Explorer



Presentation FX 5.1



Recycle Bin



Incite Media Assistant



My Briefcase



BluePages



WinZip



Vm



Fuel

Tivoli2do2day - ...

Exploring - SAN...

Lotus Notes

48:25 - Tivoli Gl...

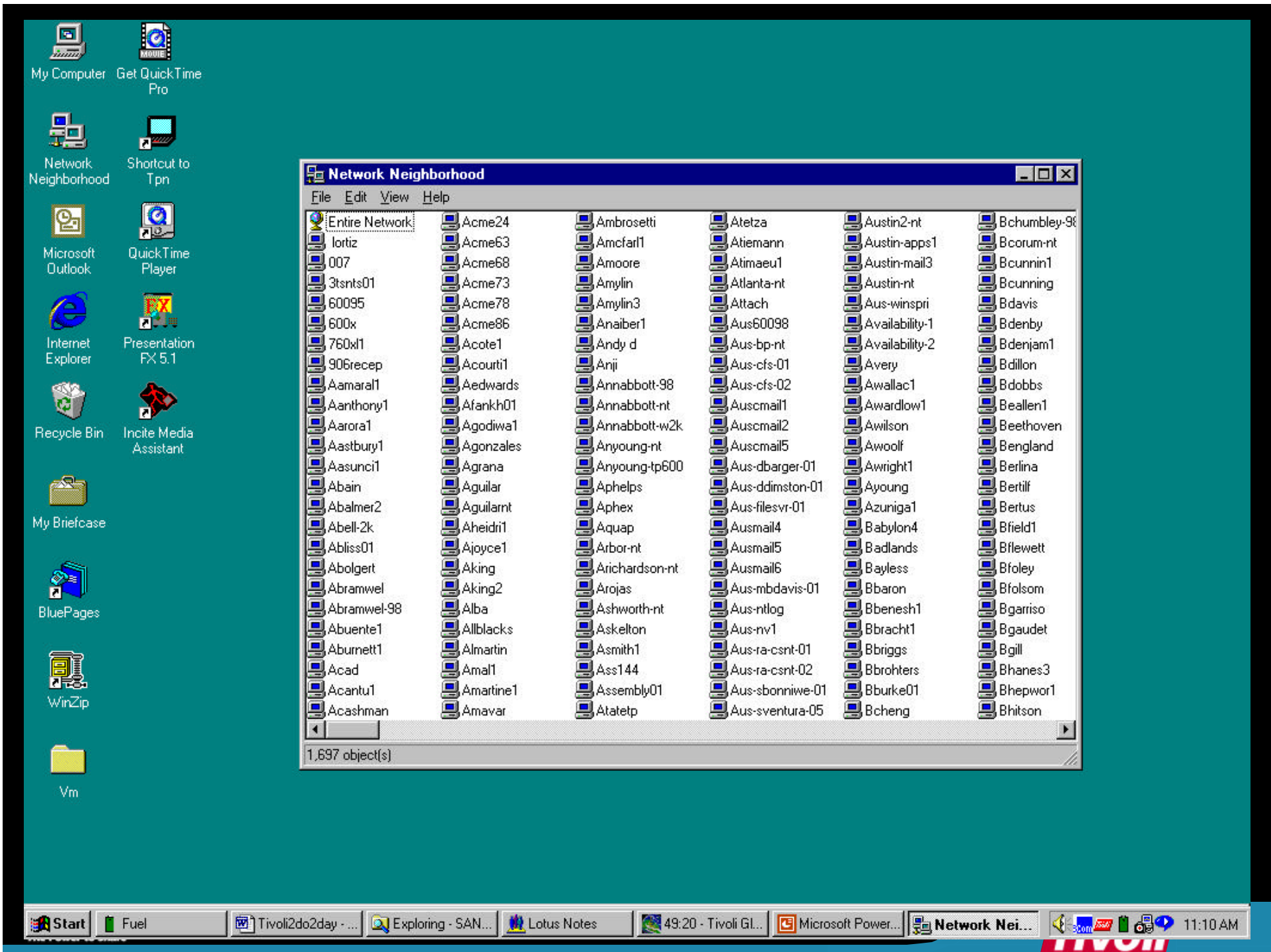
Microsoft Power...

Network Neighb...



11:09 AM





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Network Neighborhood

File Edit View Help

Chisler-nt Crmapp1 Cwilkes1 Dcalegar Dhanks12 Dotteson3
 Chlavaty Cress2 Cwiser Dociend1 Dharper2 De4000et
 Chobbst
 Chopin
 Chw
 Ckime
 Clarinet
 Cmcada
 Cmcdon
 Cmorela
 Chorton
 Cobra
 Colemar
 Convers
 Cookie_
 Coralree
 Corp-em
 Corts1
 Cpan01
 Cpowell
 Cpurdy
 Cpurdy-r
 Craigs-r
 Criedel-S
 Crm2

1 object(s)

Coralree

File Edit View Help

edrive Printers

2 object(s)

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edrive on Coralreef

File Edit View Help

[Carl]	issi	local	Psm
Recycler	swd	ffastun.ffa	ffastun.ffi
ffastun.ffe	ffastun0.fix	ltsuser1.udc	pagefile.sys

12 object(s) 50.4MB

- Convers
 - Cookie_
 - Coralree
 - Corp-em
 - Corts1
 - Cpan01
 - Cpowell
 - Cpurdy
 - Cpurdy-r
 - Craigs-r
 - Criedel-S
 - Crm2
- 1 object(s) s

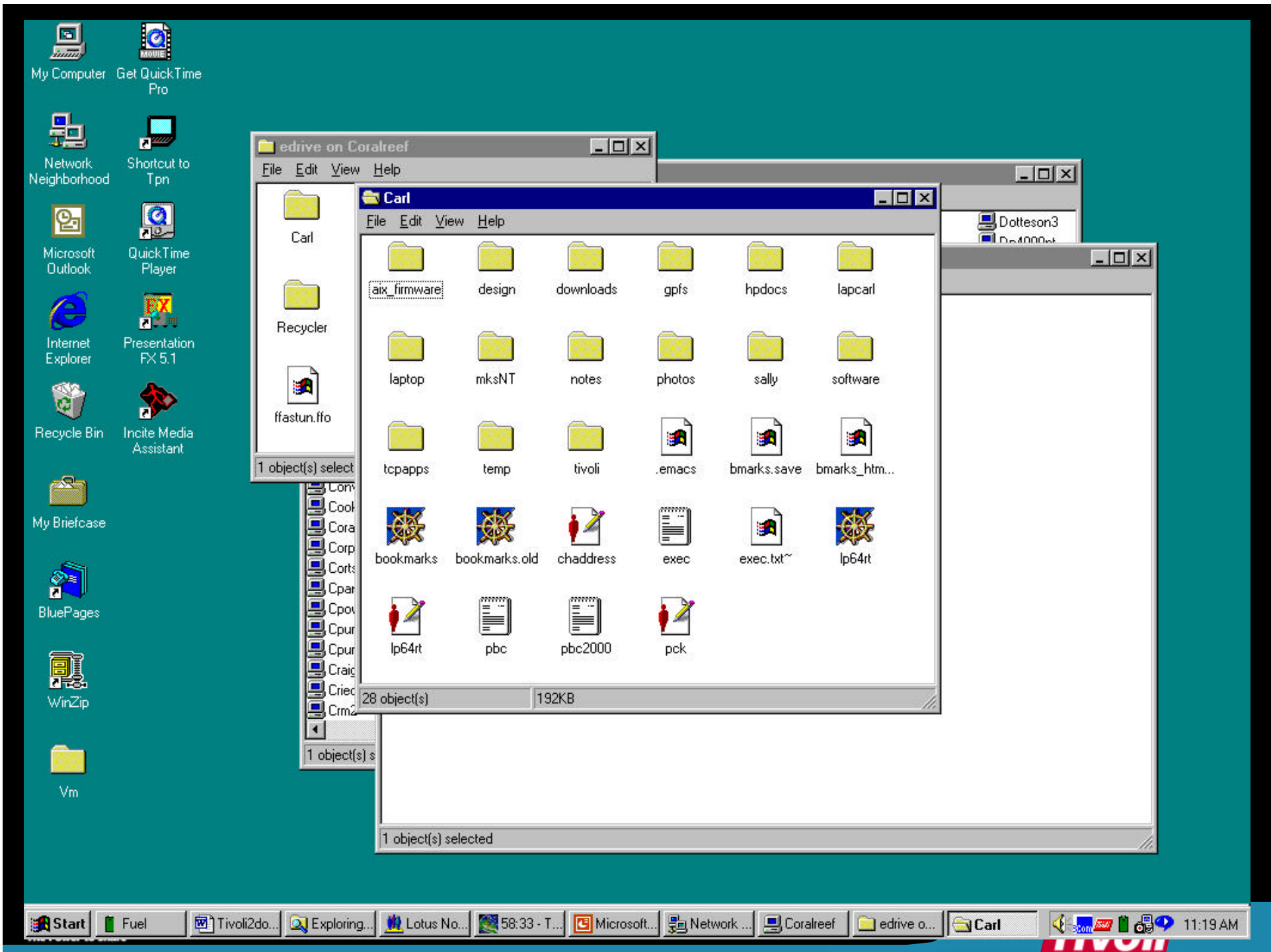
1 object(s) selected

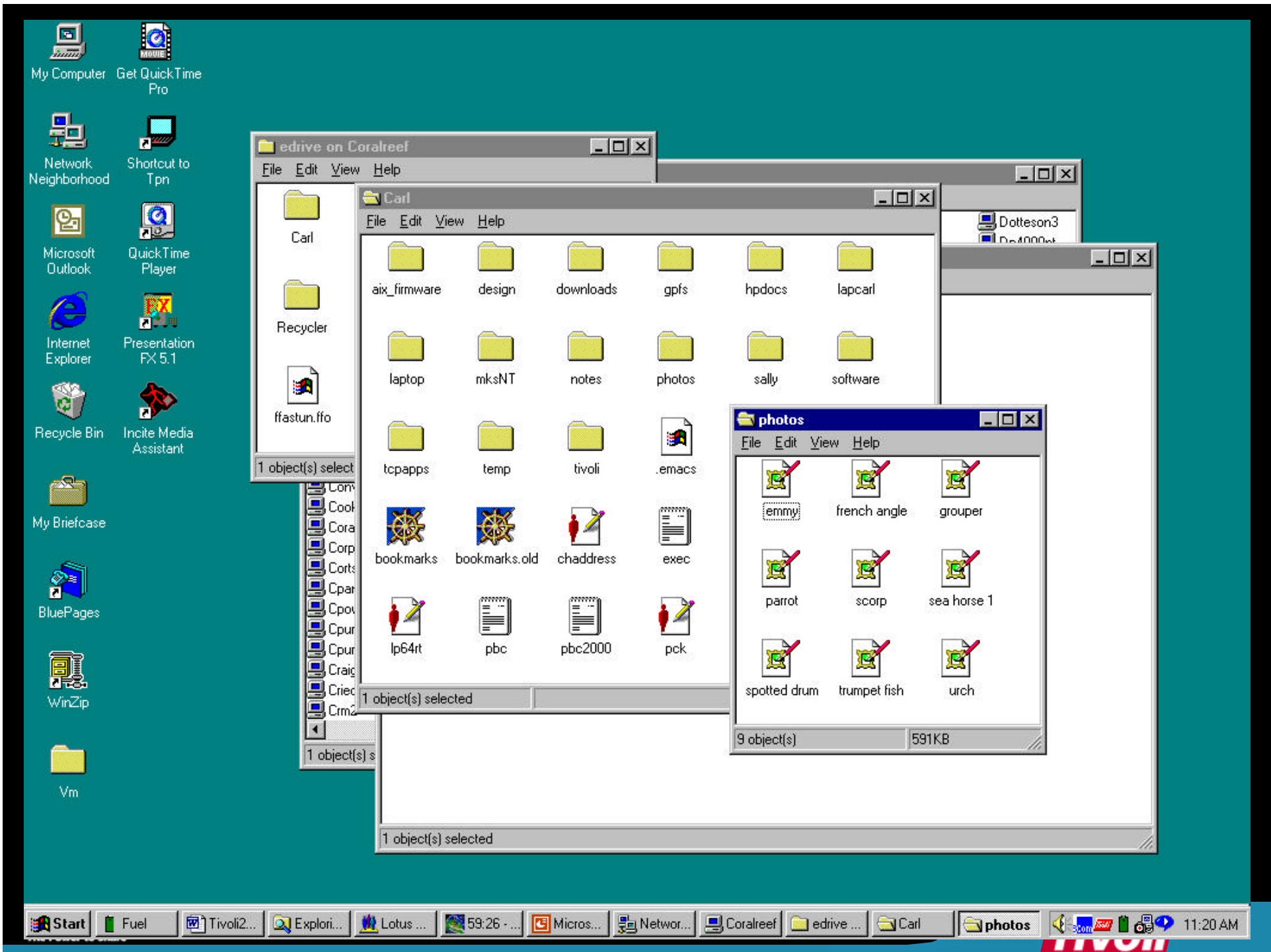
Network Neighborhood

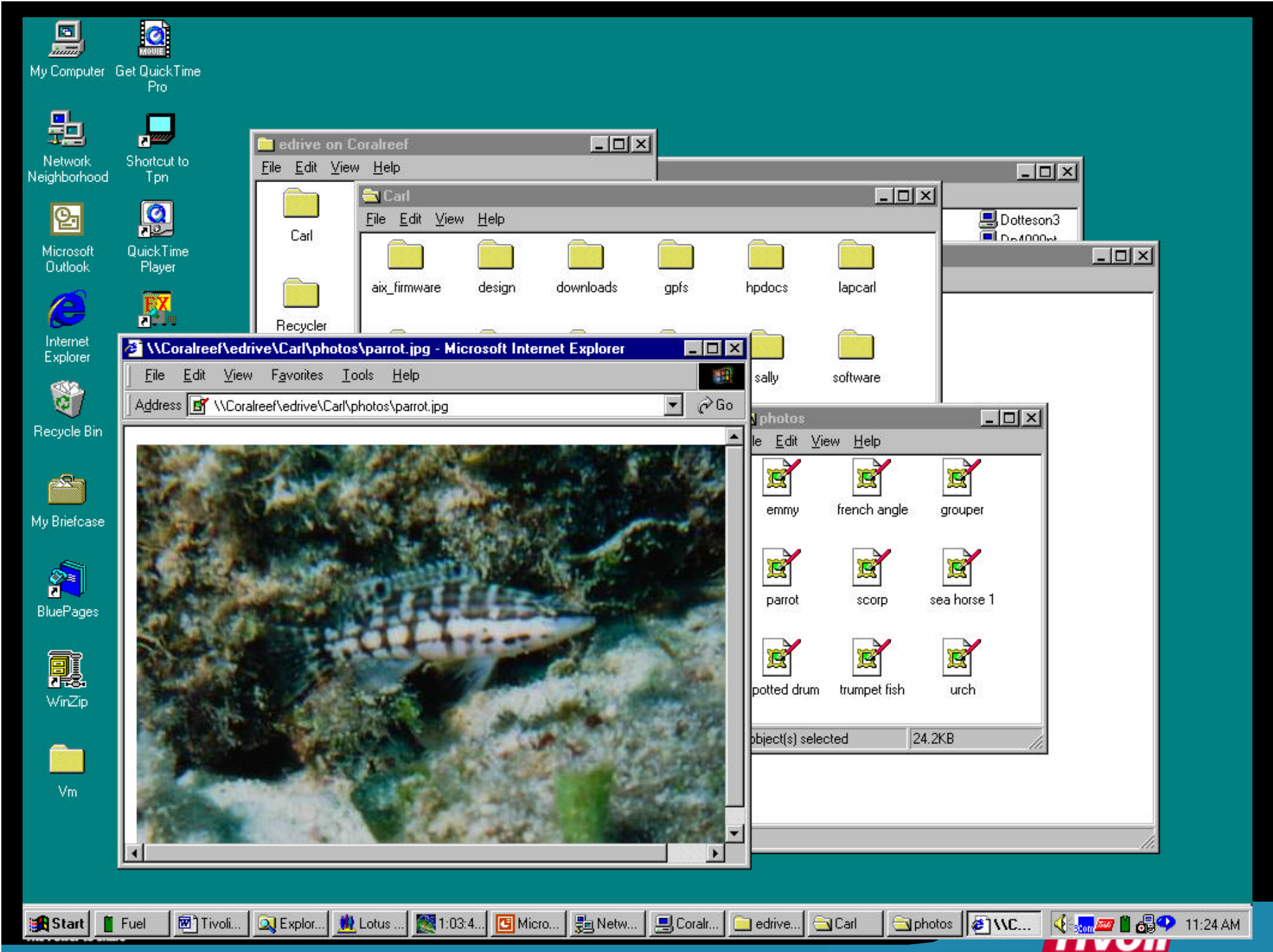
Dcalegar Dhanks12 Dotteson3

Dcalegar2 Dhanks2 Dotteson3

1 object(s) selected







- My Computer
- Get QuickTime Pro
- Network Neighborhood
- Shortcut to Tpn
- Microsoft Outlook
- QuickTime Player
- Internet Explorer
- Presentation FX 5.1
- Recycle Bin
- Incite Media Assistant
- My Briefcase
- BluePages
- WinZip
- Vm

Bburke01 [_] [□] [×]

File Edit View Help

1 object(s)

[_] [□] [×]

Austin2-nt	Bchumbley-90
Austin-apps1	Bcorum-nt
Austin-mail3	Bcunnin1
Austin-nt	Bcunning
Aus-winspri	Bdavis
Availability-1	Bdenby
Availability-2	Bdenjam1
Avery	Bdillon
Awallac1	Bdobbs
Awardlow1	Beallen1
Awilson	Beethoven
Awoolf	Bengland
Awright1	Berlina
Ayoung	Bertilf
Azuniga1	Bertus
Babylon4	Bfield1
Badlands	Bflewett
Bayless	Bfoley
Bbaron	Bfolsom
Bbenesh1	Bgarriso
Bbracht1	Bgaudet
Bbriggs	Bgill
Bbrohters	Bhanes3
	Bhepwor1
	Bhitson

1 object(s) selected

Acantu1	Amartine1	Assembly01	Aus-sbonniwe-01	Bburke01
Acashman	Amavar	Atatetp	Aus-sventura-05	Bcheng

1 object(s) selected



Window: Bburke01
File Edit View Help
C

1 object(s) selected

Enter Network Password

Incorrect password or unknown username for:
\\Bburke01\C

Connect As:

Password:

OK Cancel Help

Window: Explorer

Austin2-nt	Bchumbley-90
Austin-apps1	Bcorum-nt
Austin-mail3	Bcunnin1
Austin-nt	Bcunning
Aus-winspri	Bdavis
Availability-1	Bdenby
Availability-2	Bdenjam1
Avery	Bdillon
Awallac1	Bdobbs
Awardlow1	Beallen1
Awilson	Beethoven
Awoolf	Bengland
Awright1	Berlina
Ayoung	Bertilf
Azuniga1	Bertus
Babylon4	Bfield1
Badlands	Bflewett
Bayless	Bfoley
Bbaron	Bfolsom
Bbenesh1	Bgarriso
Bbracht1	Bgaudet
Bbriggs	Bgill
Bbrothers	Bhanes3
Acantu1	Bhepwor1
Acashman	Bhitson
Amartine1	
Assembly01	
Aus-sbonniwe-01	
Bburke01	
Aus-sventura-05	
Bcheng	

1 object(s) selected



My Computer



Get QuickTime Pro



Network Neighborhood



Shortcut to Tpn



Microsoft Outlook



QuickTime Player



Internet Explorer



Presentation FX 5.1



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Tivoli2do2day - ...

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11:09 AM



My Computer
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Incite Media Assistant

My Briefcase
Netscape Communicator

BluePages

WinZip

Vm

My Computer [Min] [Max] [Close]

File Edit View Help

3 1/2 Floppy (A:) C: D: Control Panel Printers

Dial-Up Networking Scheduled Tasks Web Folders

1 object(s) selected | Free Space: 8.93GB, Capacity: 11.2GB

Start

Fuel

Tivoli2do2day - ...

Exploring - SAN...

Lotus Notes

Microsoft Power...

My Computer

[System Tray Icons] 7:07 PM

My Computer Get QuickTime Pro

Network Neighborhood Shortcut to Tpn

Microsoft Outlook QuickTime Player

Internet Explorer Presentation FX 5.1

Recycle Bin Incite Media Assistant

My Briefcase Netscape Communicator

BluePages

WinZip

Vm

My Computer File Edit View Help

3½ Floppy (A:) [CD-ROM] [Folder] [Folder] Printers

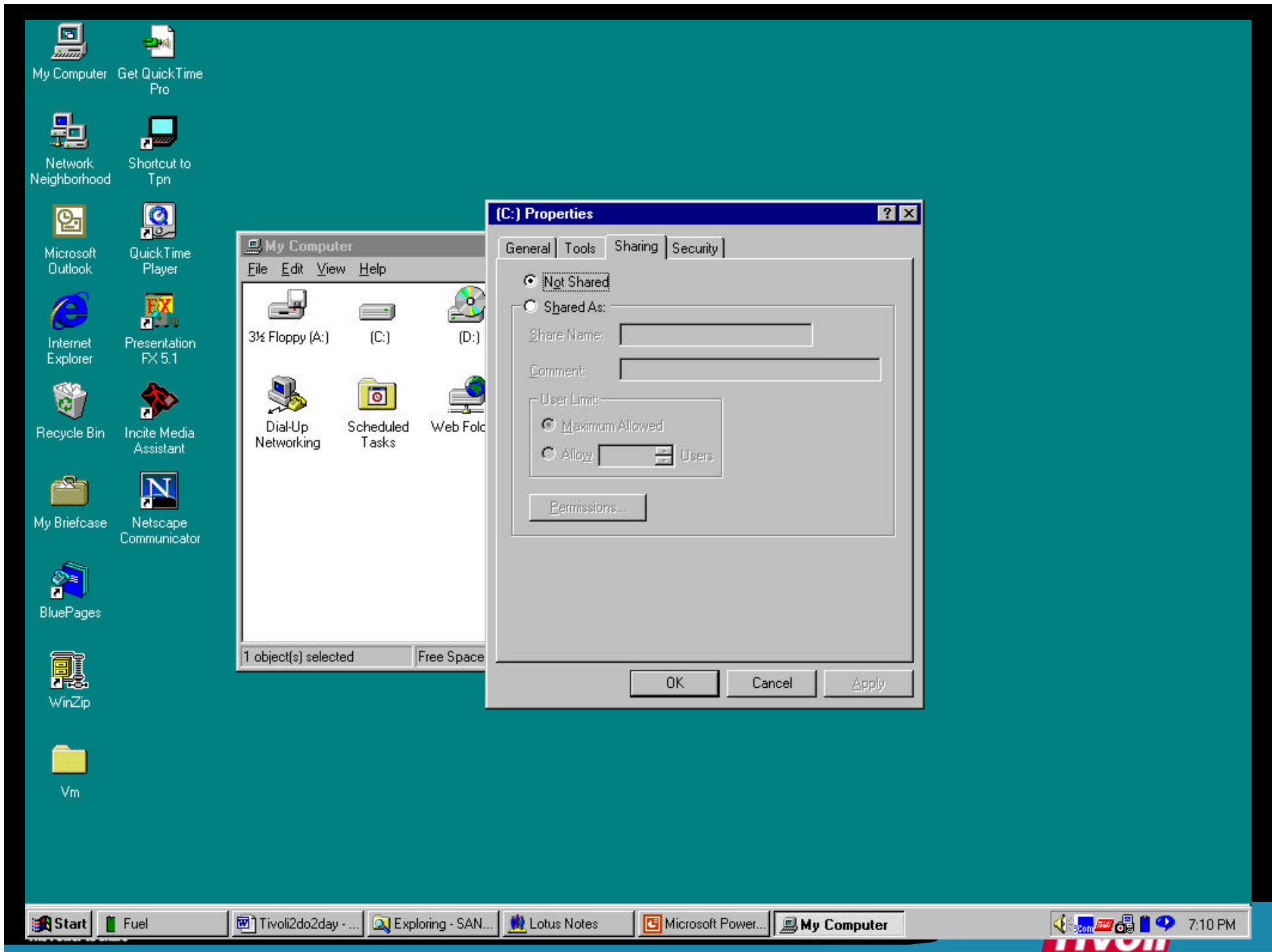
Dial-Up Networking [Folder] [Folder] [Folder] [Folder]

Sched... [Folder] [Folder] [Folder] [Folder]

Tas... [Folder] [Folder] [Folder] [Folder]

- Open
- Explore
- Find...
- Scan with Norton AntiVirus
- Sharing...**
- Add to Zip
- Format...
- Create Shortcut
- Properties

Displays the properties for sharing the selected folder



My Computer Get QuickTime Pro

Network Neighborhood Shortcut to Tpn

Microsoft Outlook QuickTime Player

Internet Explorer Presentation FX 5.1

Recycle Bin Incite Media Assistant

My Briefcase Netscape Communicator

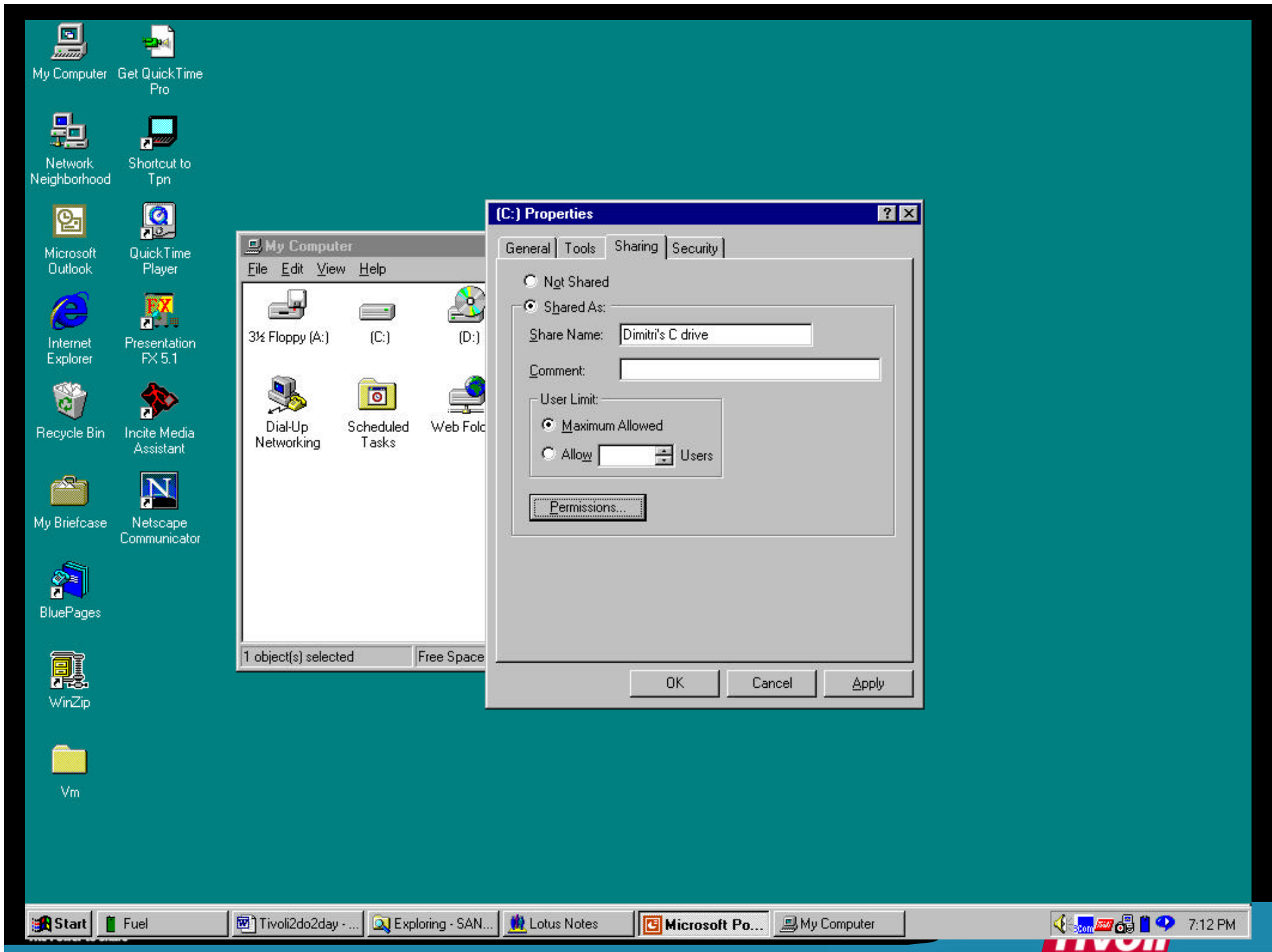
BluePages

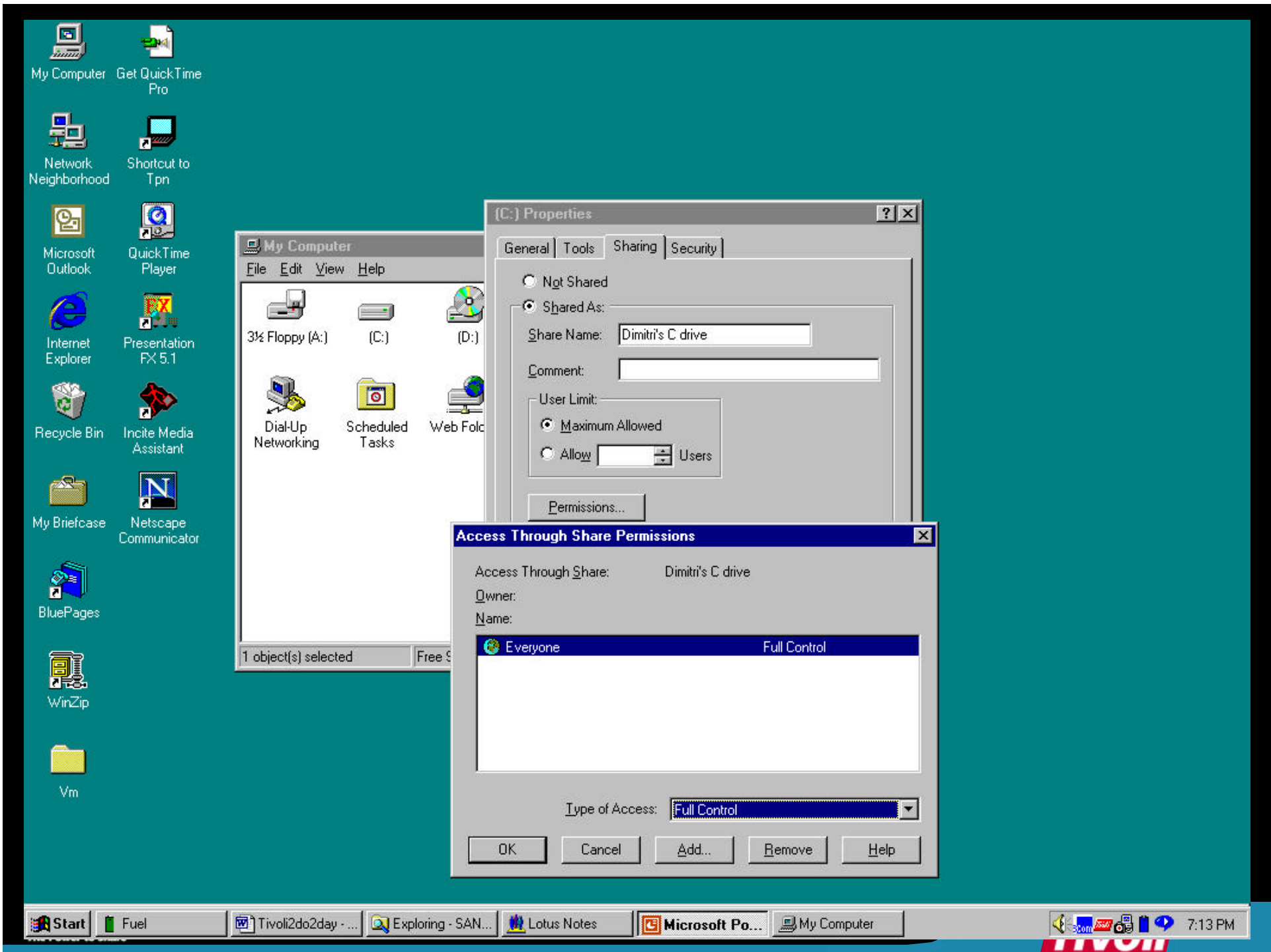
WinZip

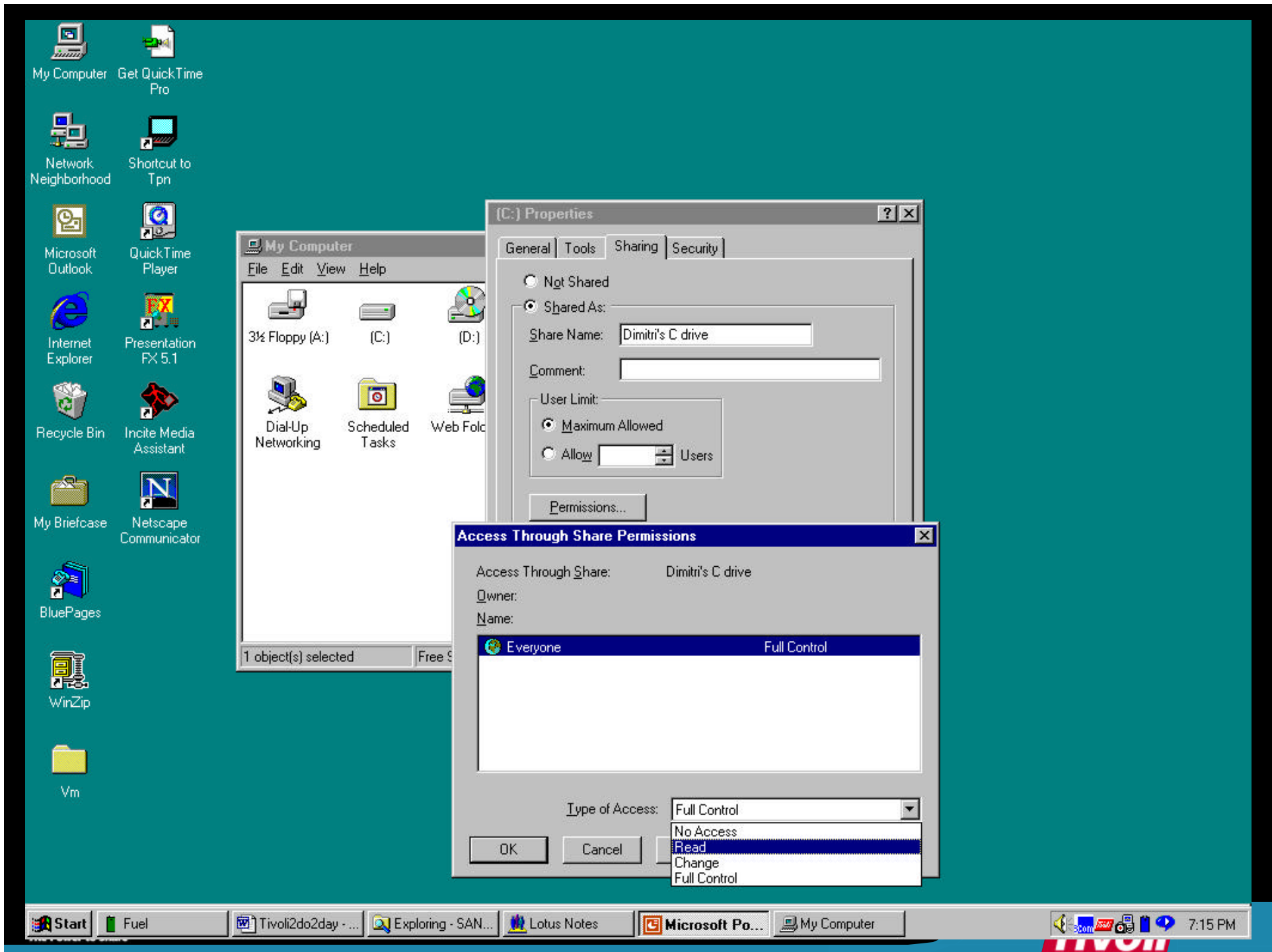
Vm

My Computer window showing drive icons: 3 1/2 Floppy (A:), (C:), (D:), Dial-Up Networking, Scheduled Tasks, Web Folc.

[C:] Properties dialog box, Sharing tab. Options: Not Shared, Shared As, Share Name, Comment, User Limit (Maximum Allowed, Allow Users), Permissions... buttons.







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My Computer [Min] [Max] [Close]

File Edit View Help

3 1/2 Floppy (A:) C: D: Control Panel Printers

Dial-Up Networking Scheduled Tasks Web Folders

1 object(s) selected | Free Space: 8.93GB, Capacity: 11.2GB

Start

Fuel

Tivoli2do2day - ...

Exploring - SAN...

Lotus Notes

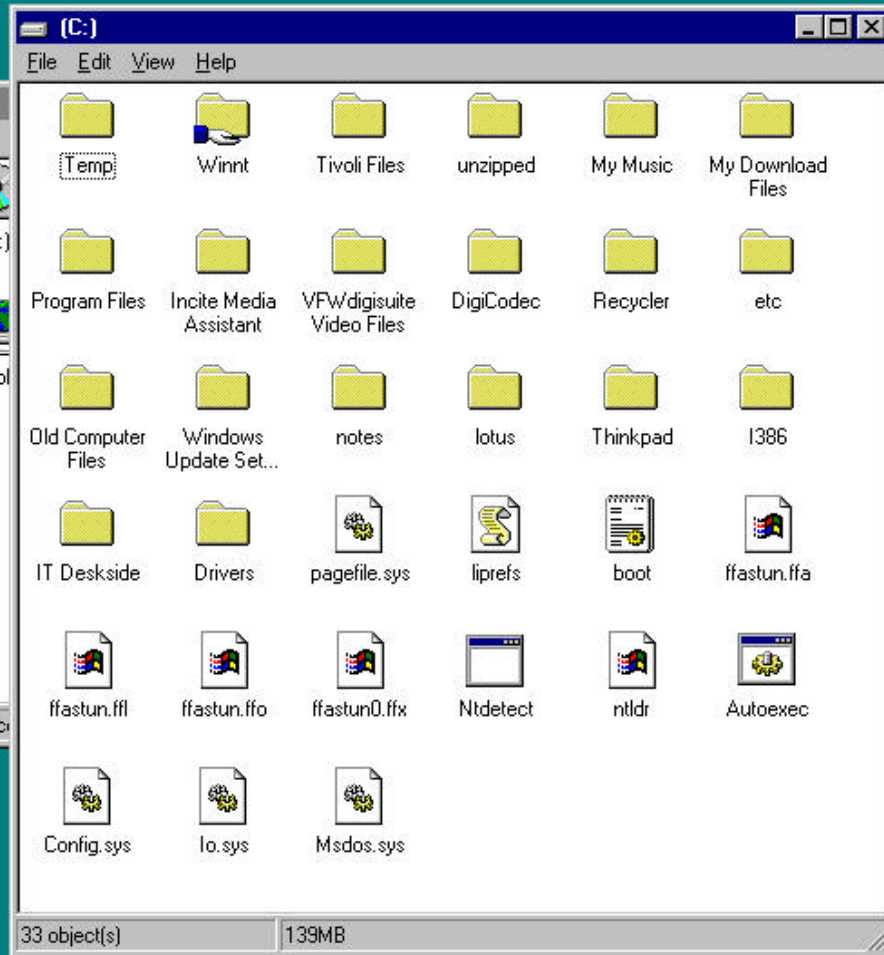
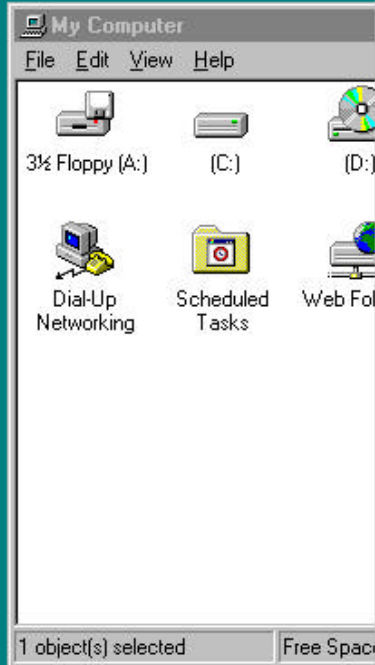
Microsoft Power...

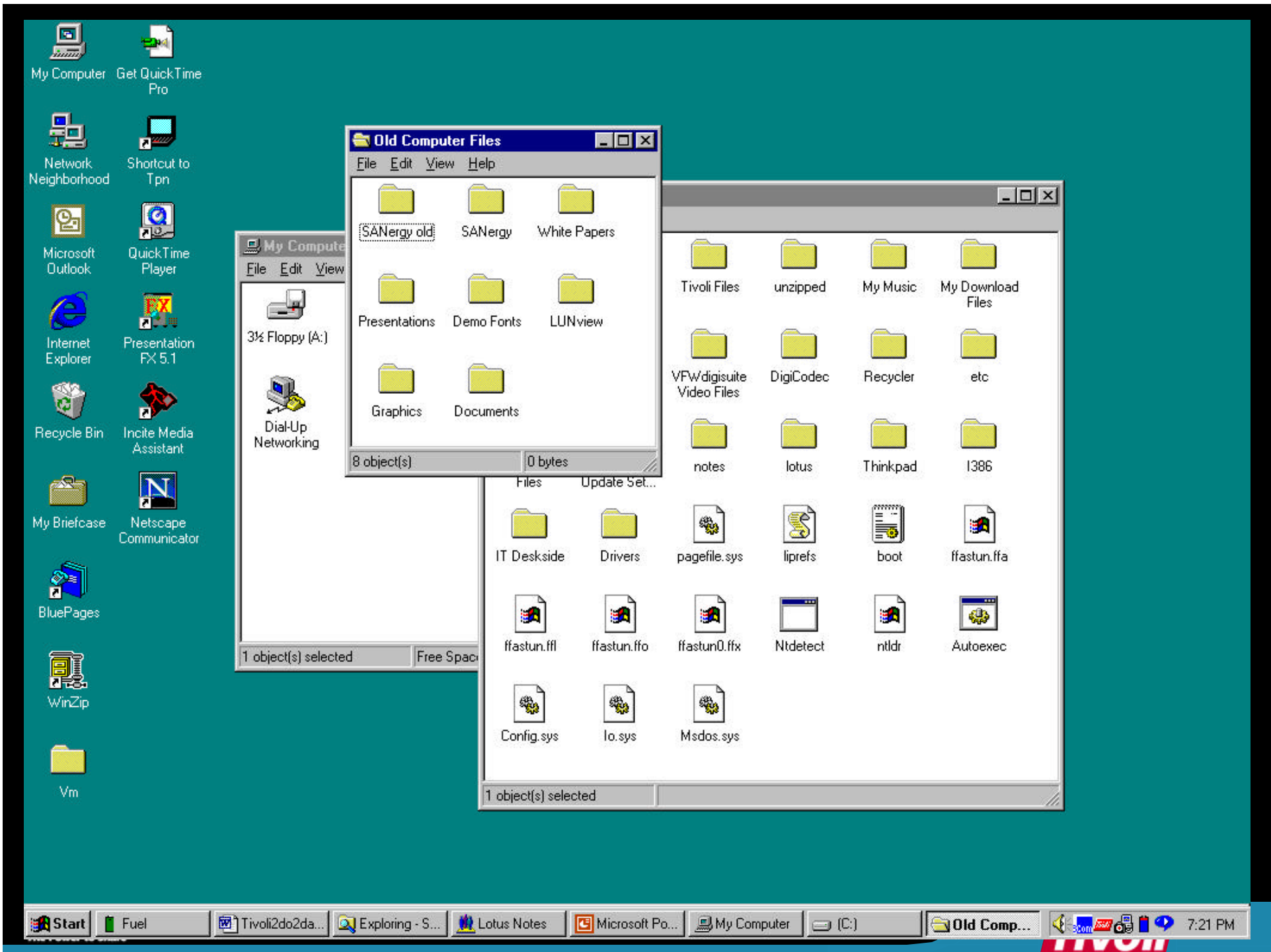
My Computer

System tray icons: Network, Volume, Safely Remove Hardware, Help and Support, Start menu, Taskbar and Navigation, System clock: 7:07 PM



- My Computer
- Get QuickTime Pro
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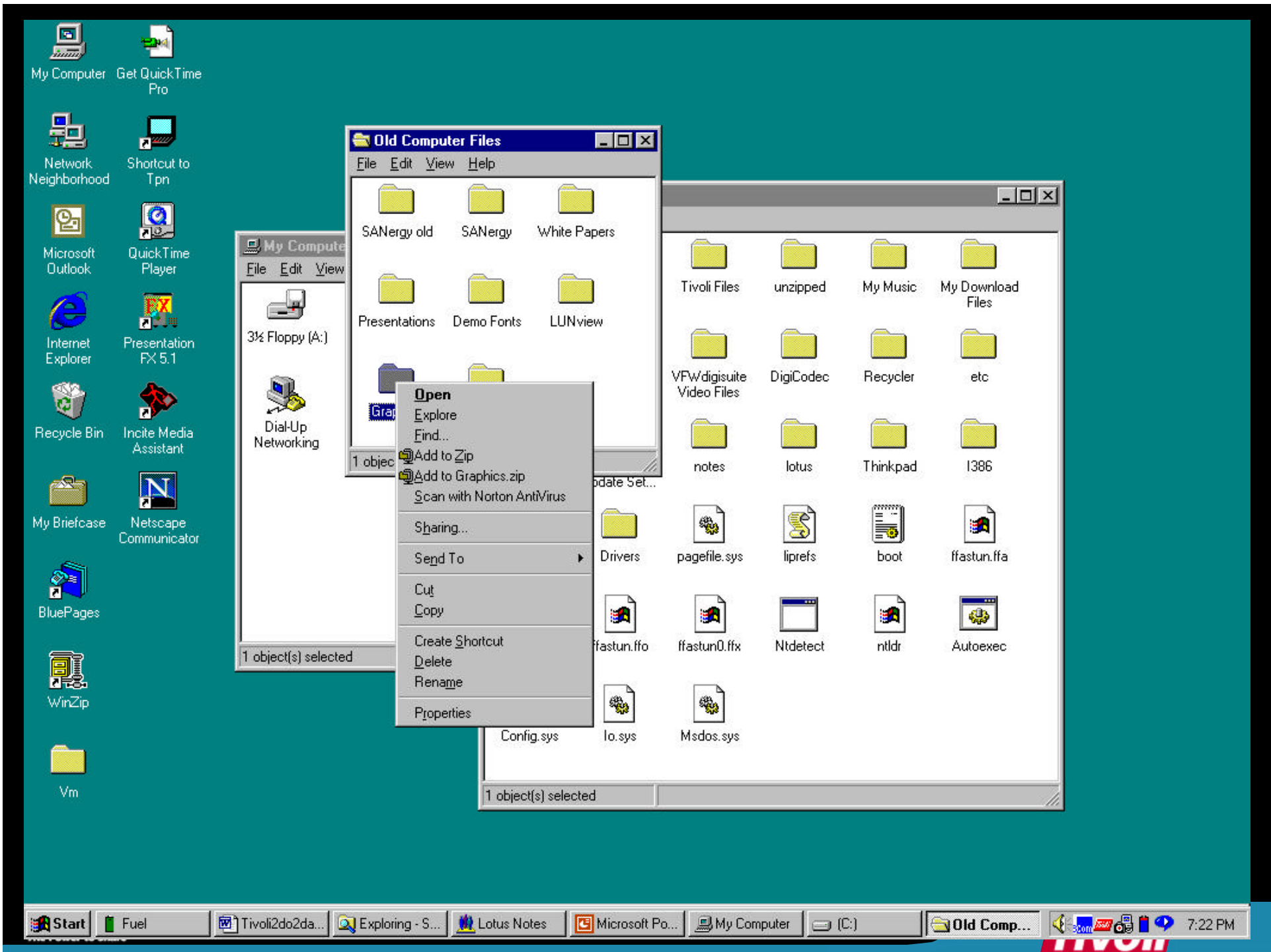
My Computer window showing '3 1/2 Floppy (A:)' and 'Dial-Up Networking'.

Old Computer Files window showing folders: SANergy old, SANergy, White Papers, Presentations, Demo Fonts, LUNview, Graphics, Documents.

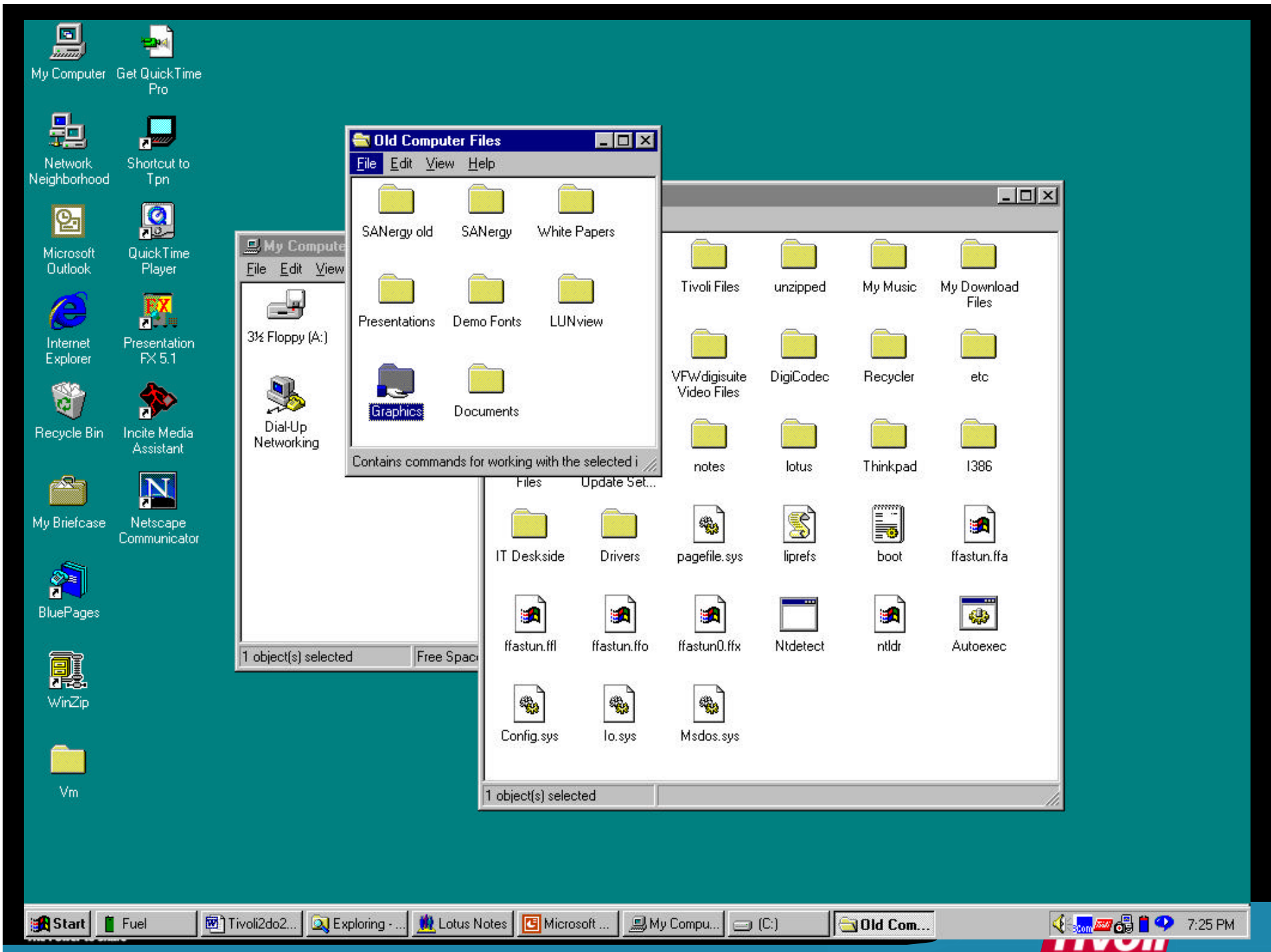
Old Computer Files window showing folders: Tivoli Files, unzipped, My Music, My Download Files, VFWDigisuite Video Files, DigiCodec, Recycler, etc, notes, lotus, Thinkpad, I386, and files: pagefile.sys, liprefs, boot, ffastun.ffa, ffastun.ffi, ffastun.ffe, ffastun0.ffx, Ntdetect, ntldr, Autoexec, Config.sys, Io.sys, Msdos.sys.

Start Fuel Tivoli2do2da... Exploring - S... Lotus Notes Microsoft Po... My Computer (C:) Old Comp... 7:21 PM







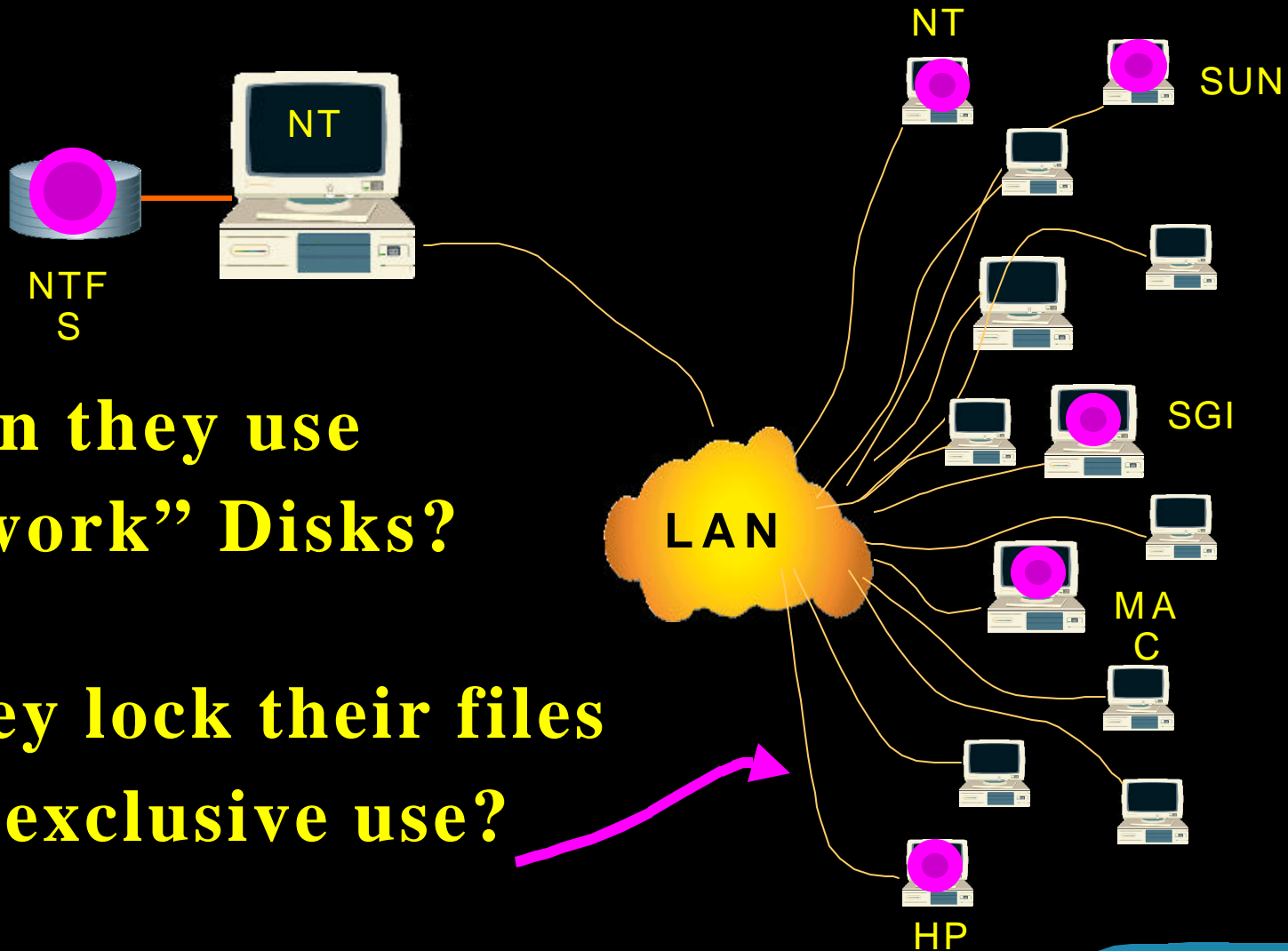


Conclusion:
Networks (LANs) Share Files

“Share Files” defined. . .

**Multiple computers
can use the same files
at the same time**

Do Applications “Share Files”?

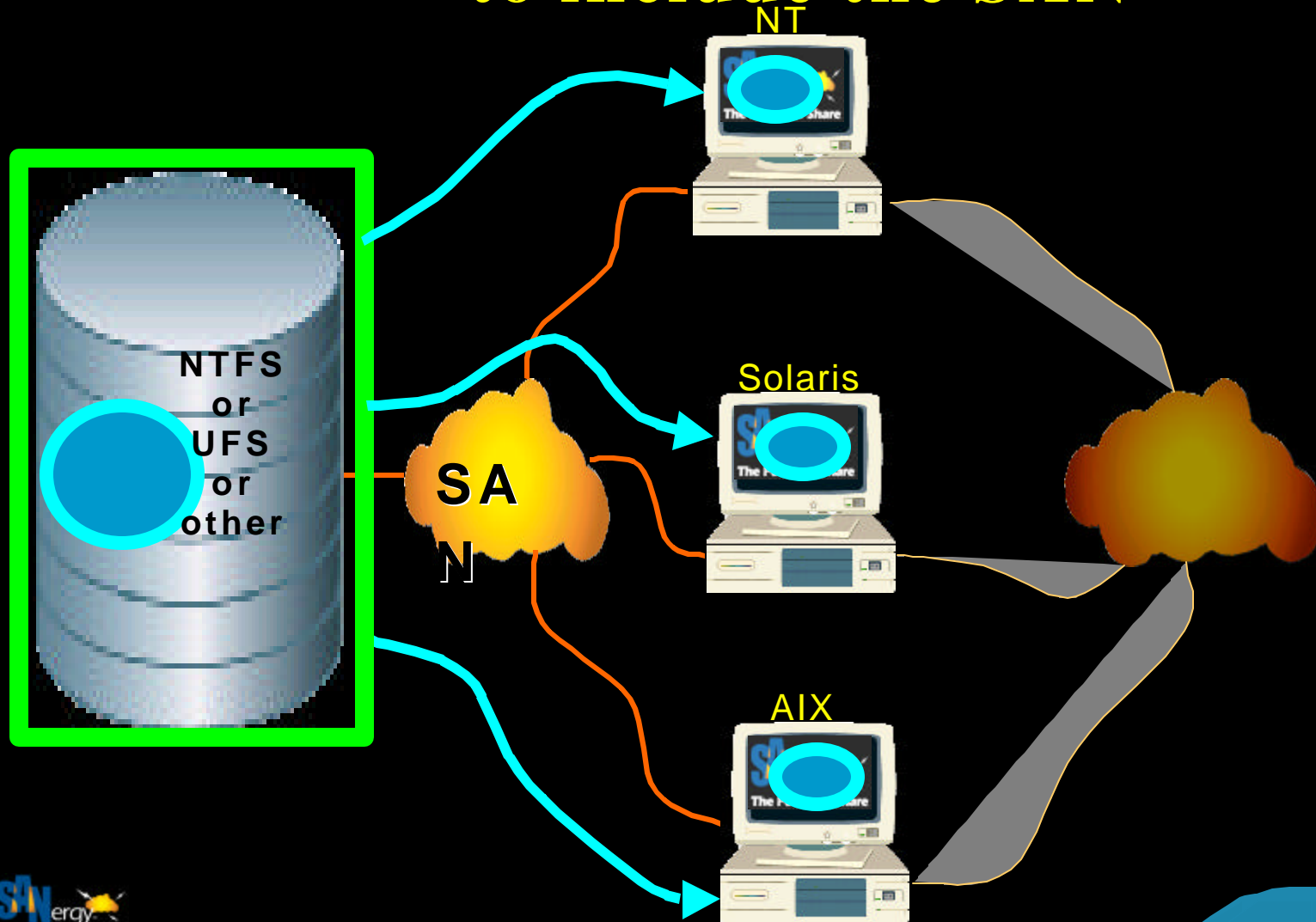


Can they use
“Network” Disks?

Do they lock their files
for exclusive use?

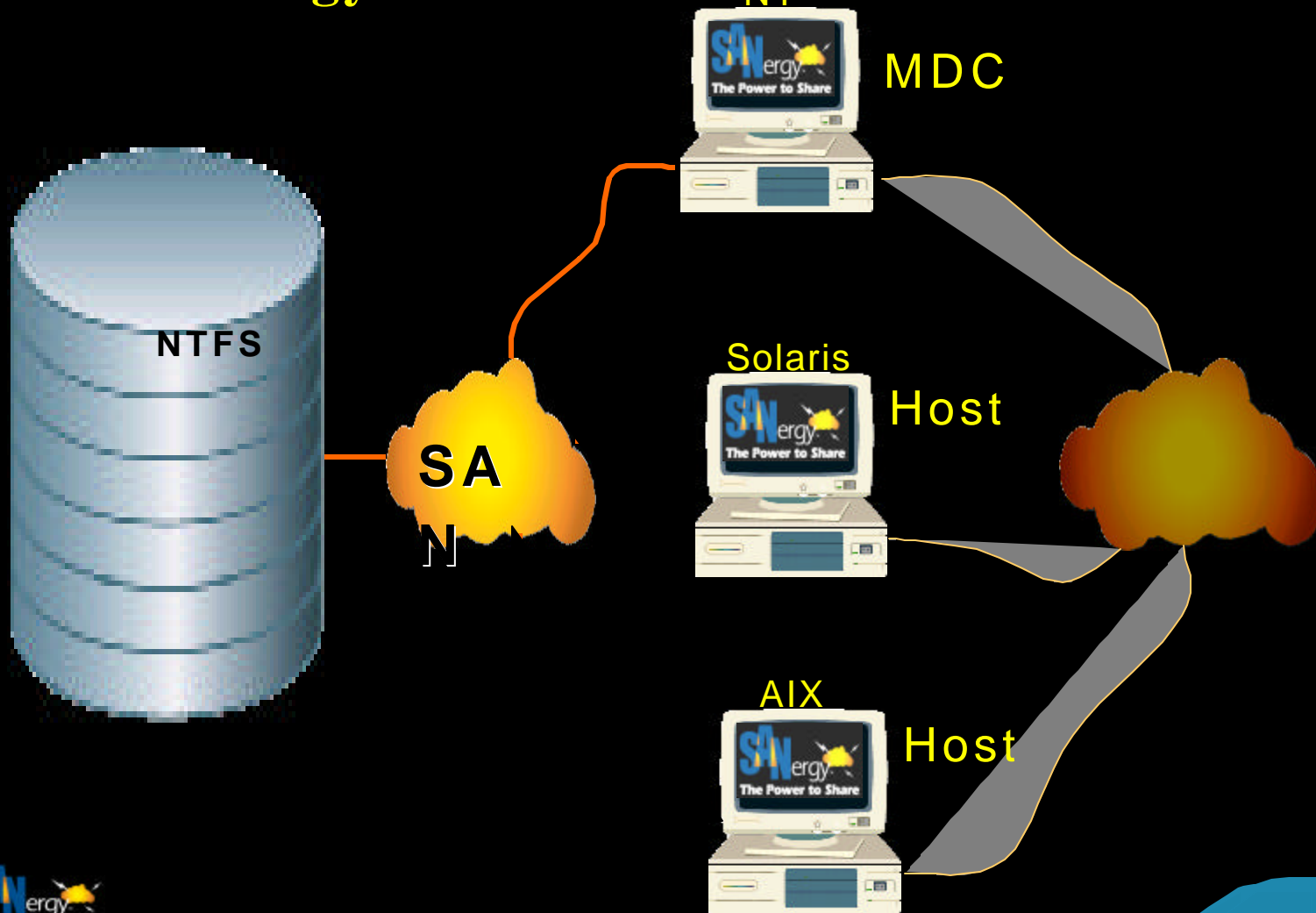
Does SANergy Share Files?

SANergy extends the LAN's file sharing to include the SAN

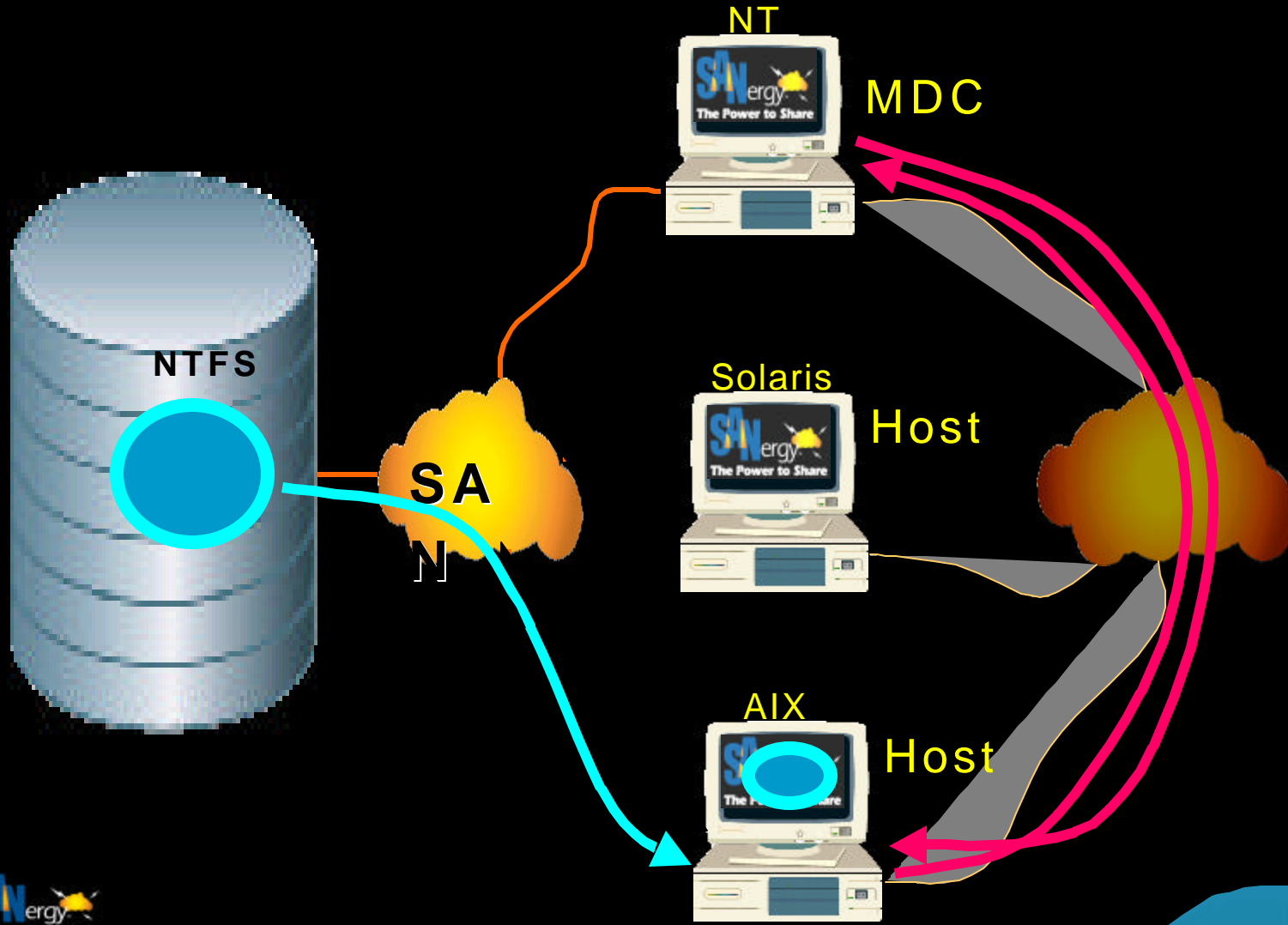


How does SANergy share files?

SANergy installed on all computers connected to SAN
At least one computer becomes the Meta Data Controller
SANergy “hides” the SAN connection on Hosts

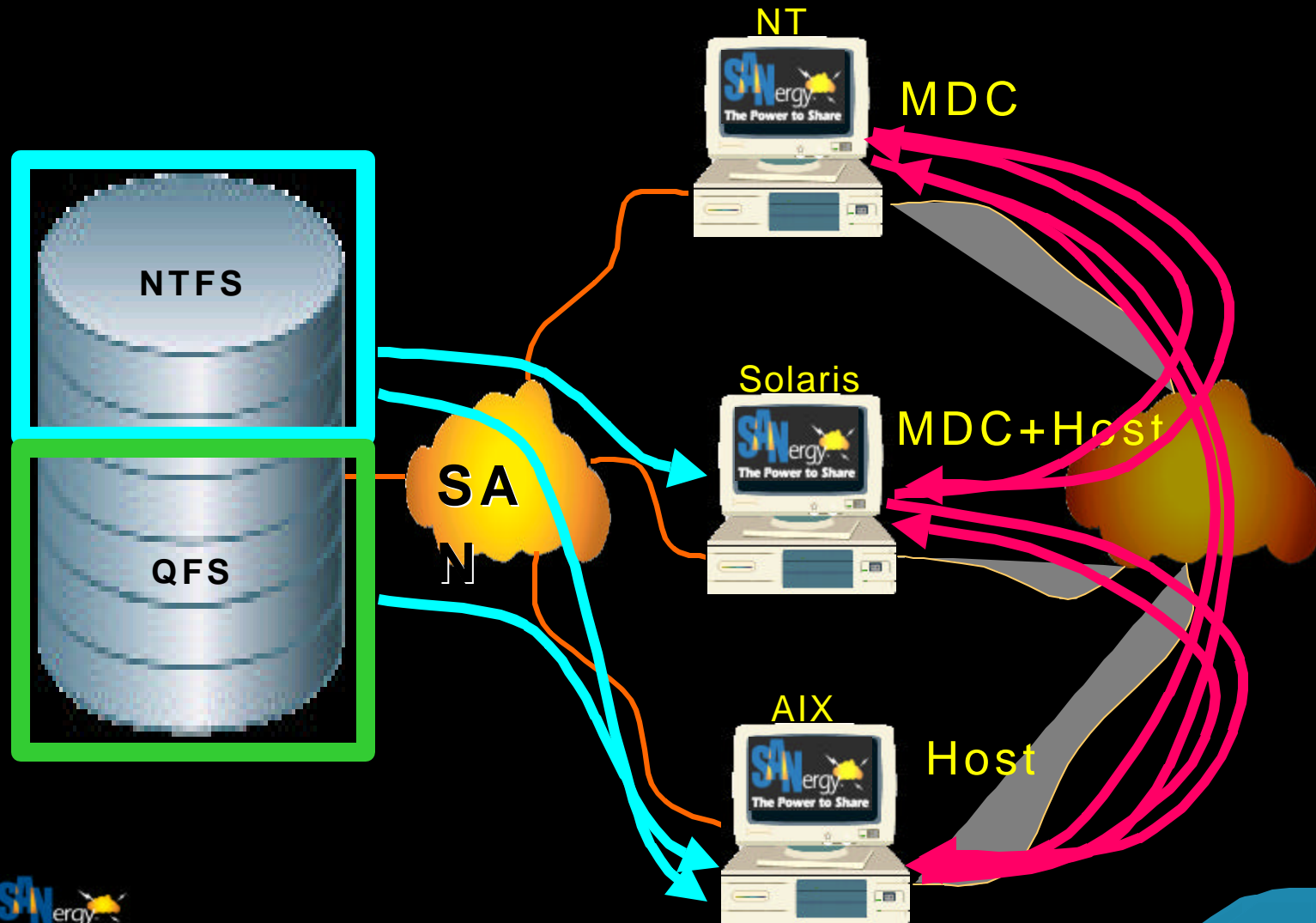


File request from host to MDC via normal methods
Negotiation then File Pointers handed back to host
SANergy opens SAN connection
Host gets file directly via SAN



More Typical SAN with SANergy

Multiple MDCs, Multiple Hosts, Multiple File Systems



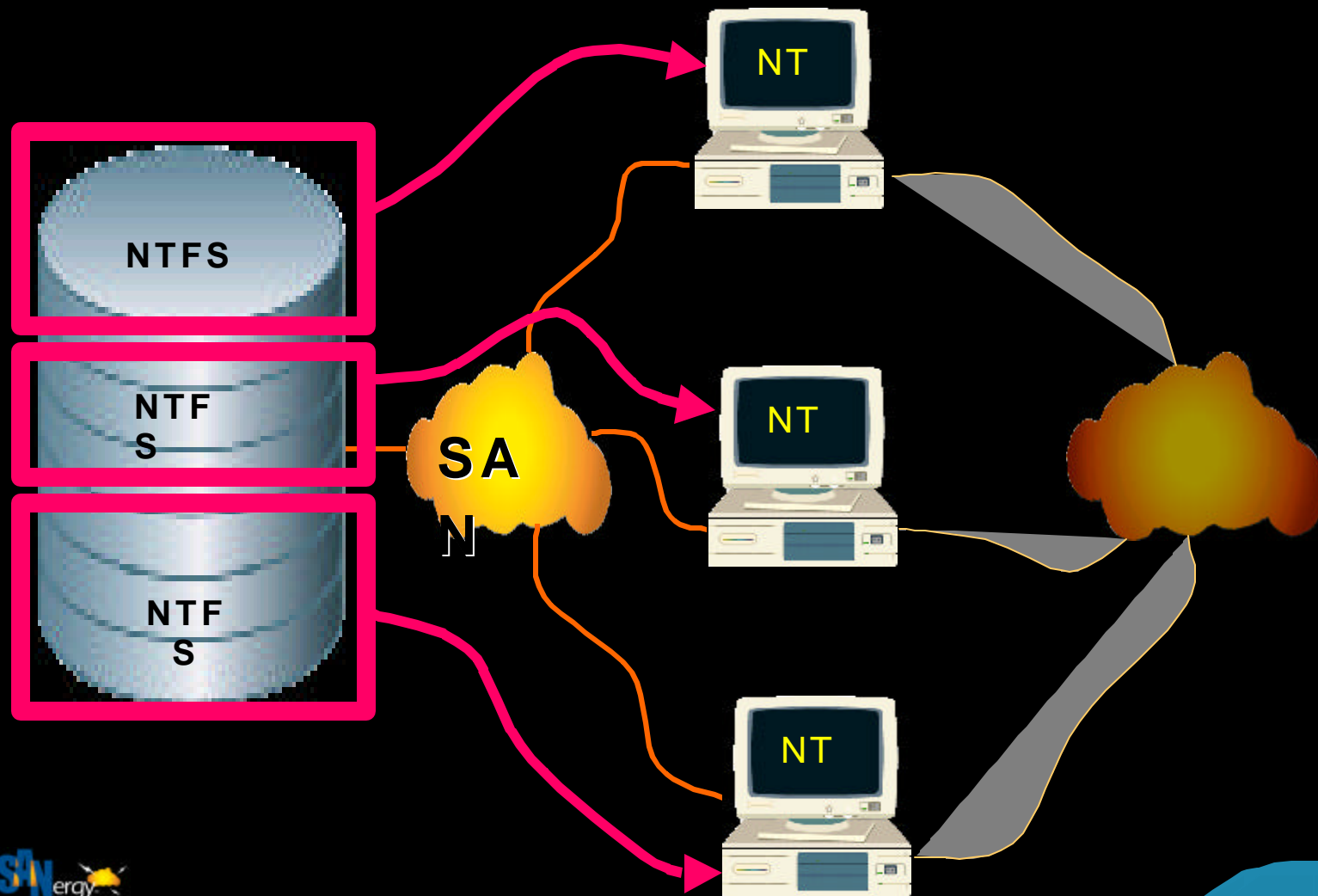
SANergy provides four major benefits

- greatly simplifies SAN-storage administration
- extends industry-standard networking to utilize the SAN
- broadens increased-data-availability protection to include any application
- can reduce the total amount of storage required in a SAN

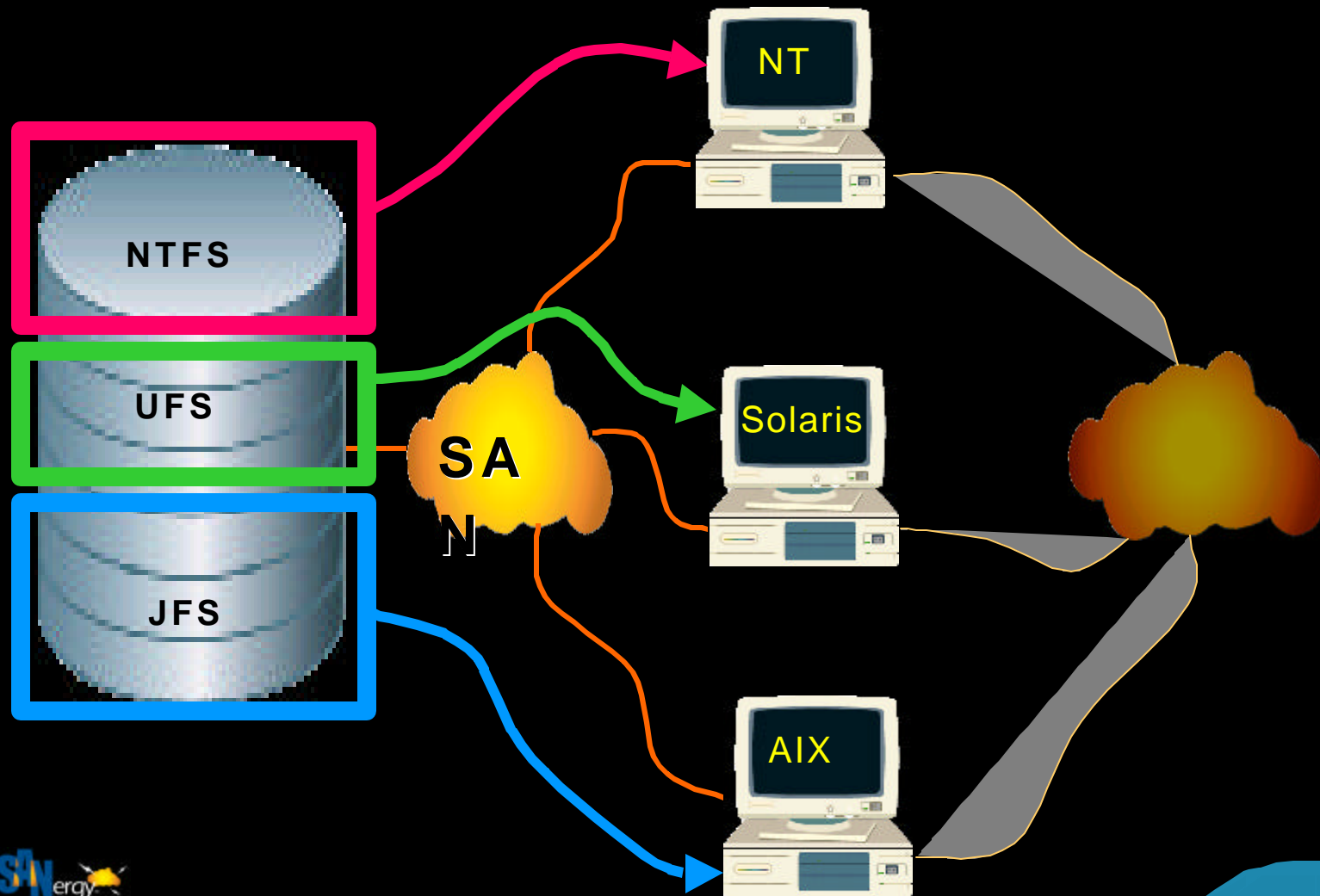
SANergy provides four major benefits

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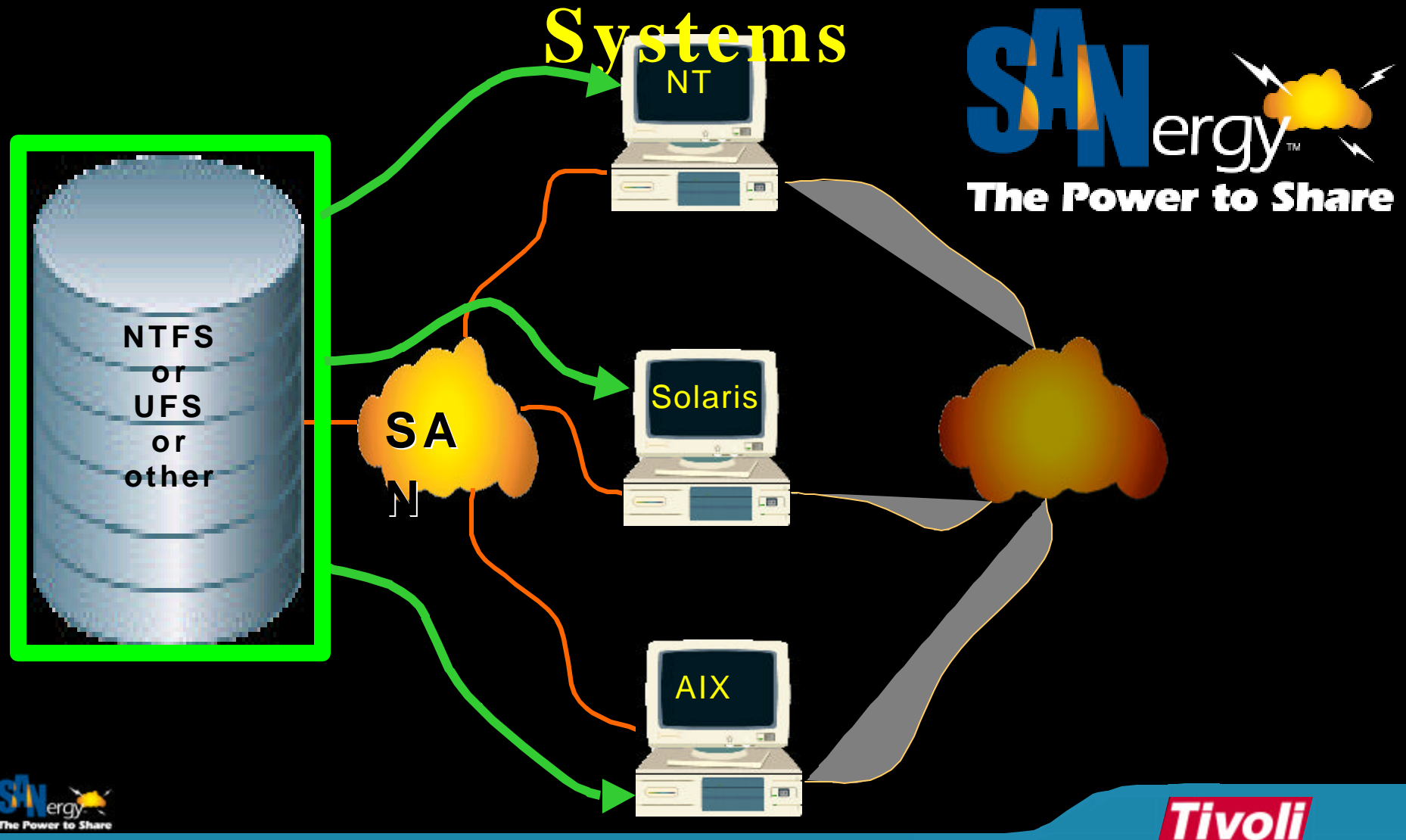
One Disk Volume Per Computer

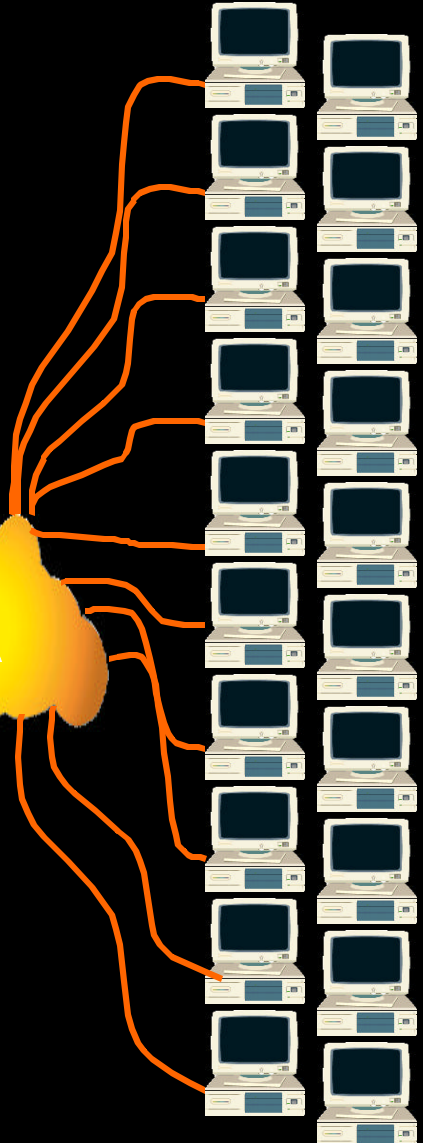
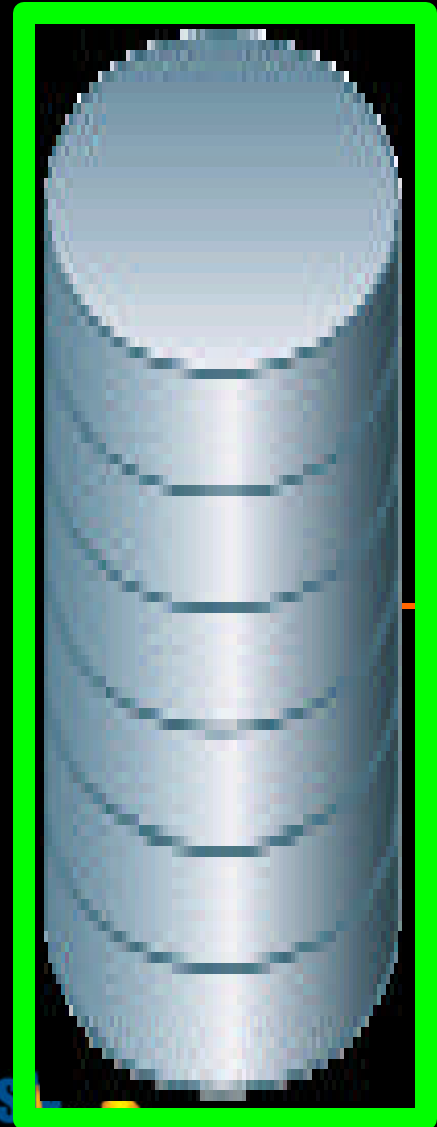


Different File System per Operating System

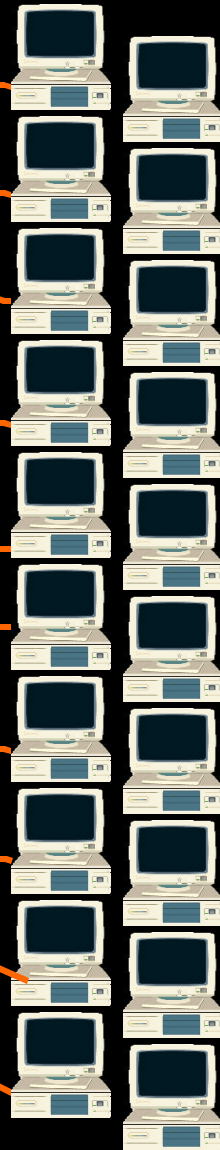
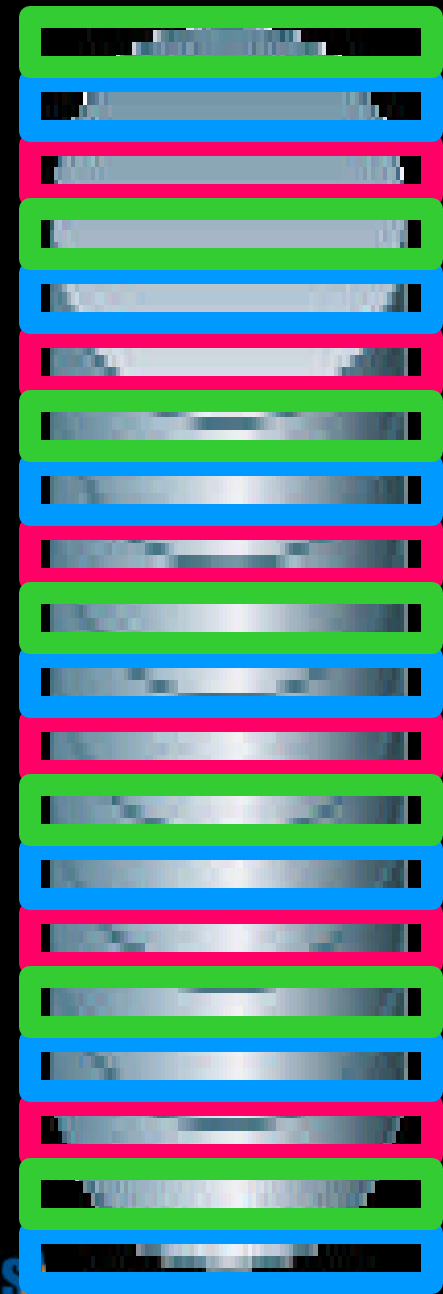


One disk volume and file system for many Computers+Operating Systems





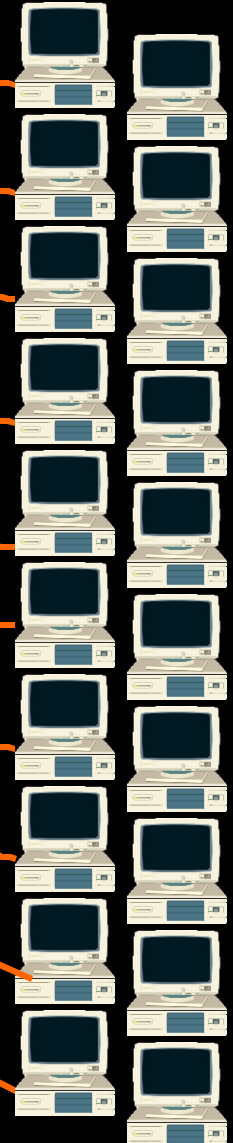
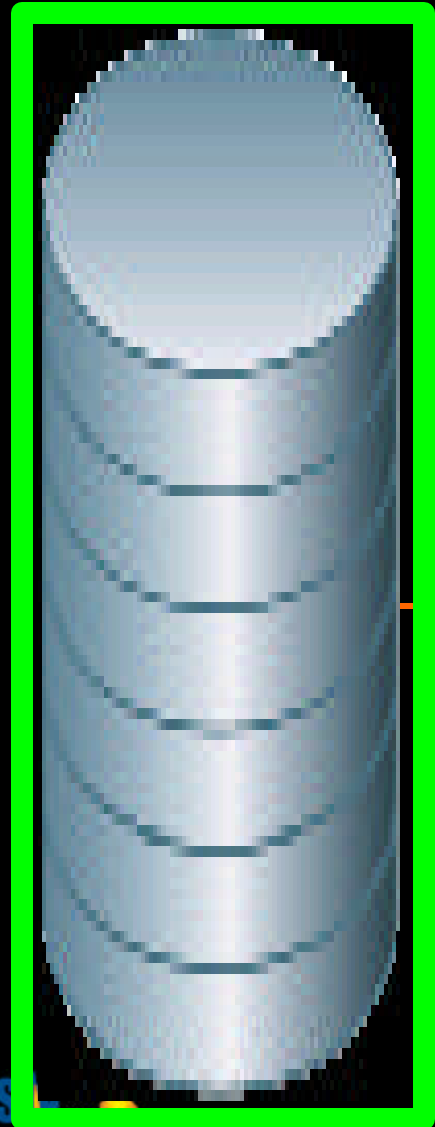
With
SANergy™
The Power to Share



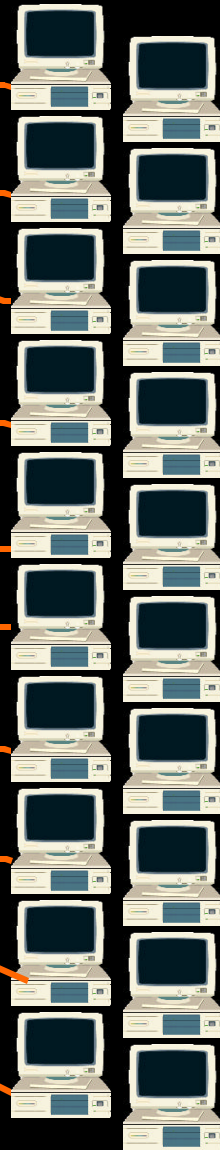
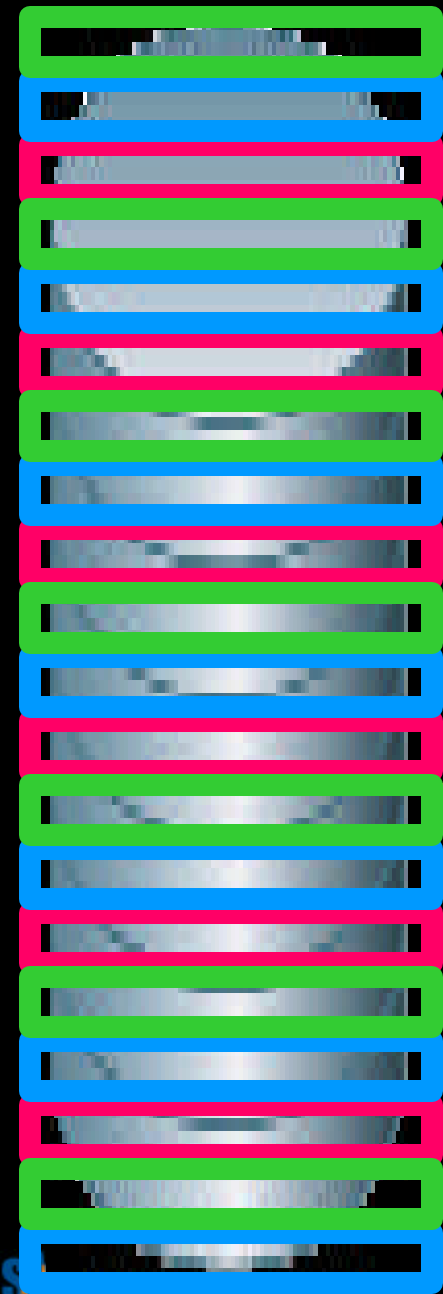
Without

SANergy™
The Power to Share





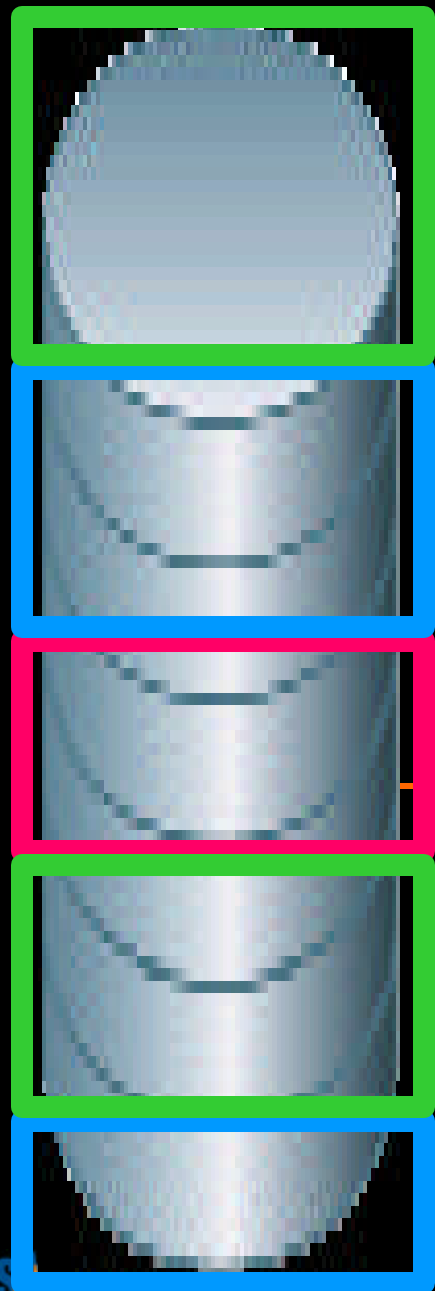
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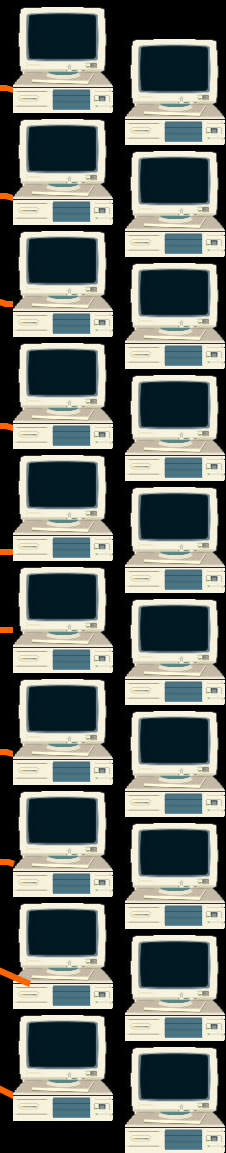
Without

SANergy™
The Power to Share





SAN



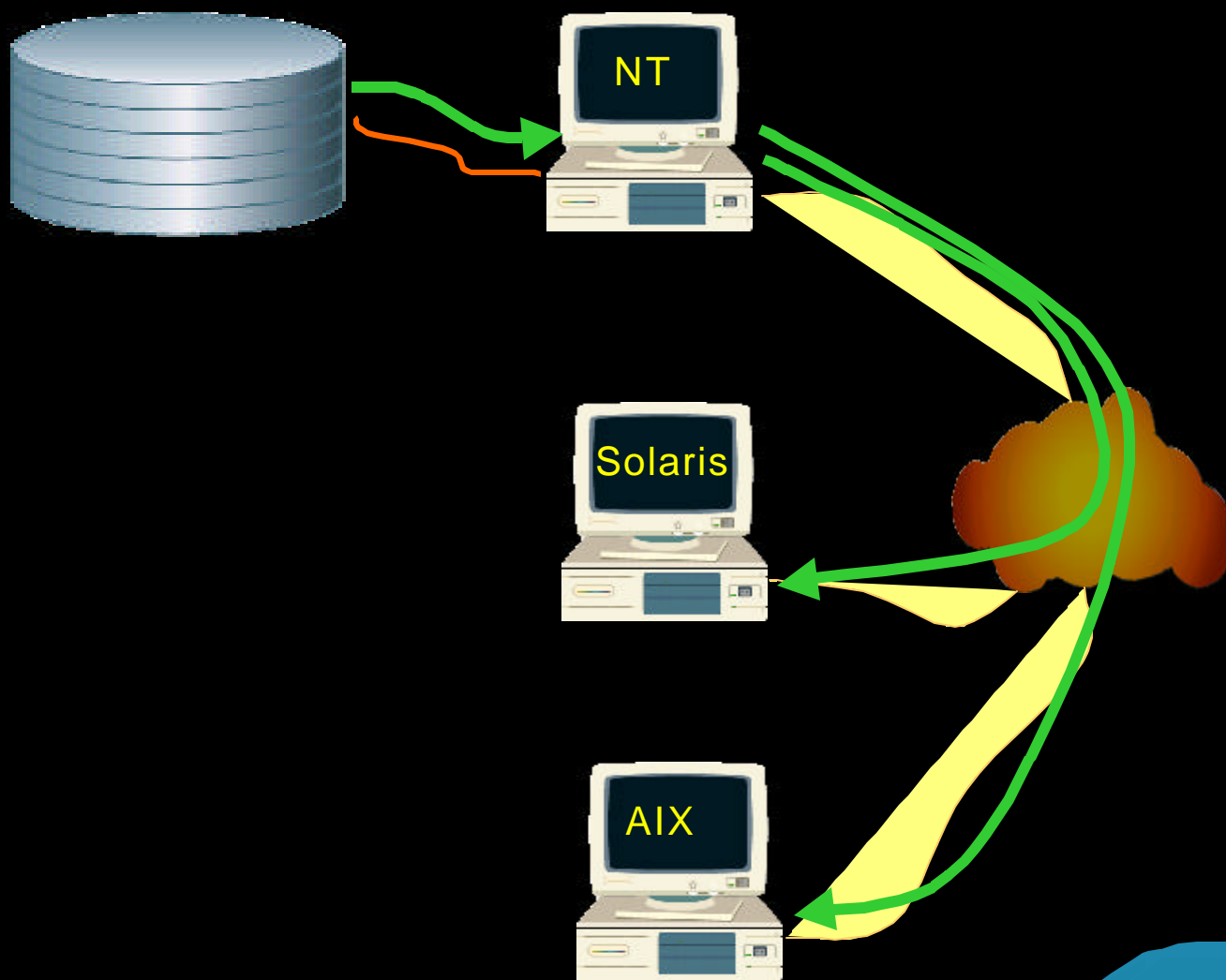
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SANergy provides four major benefits

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If computers can “share” files over the LAN . . .

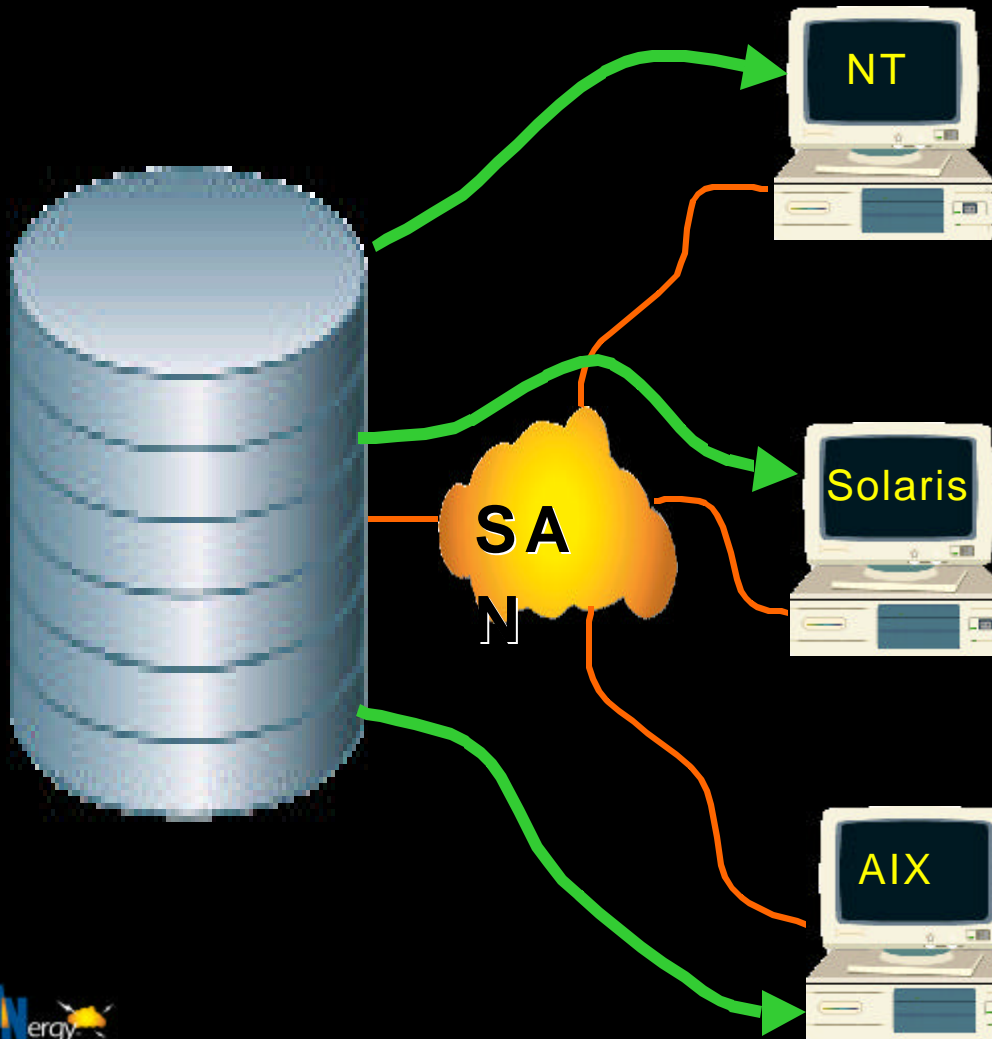


They can share files over the SAN

with



The Power to Share



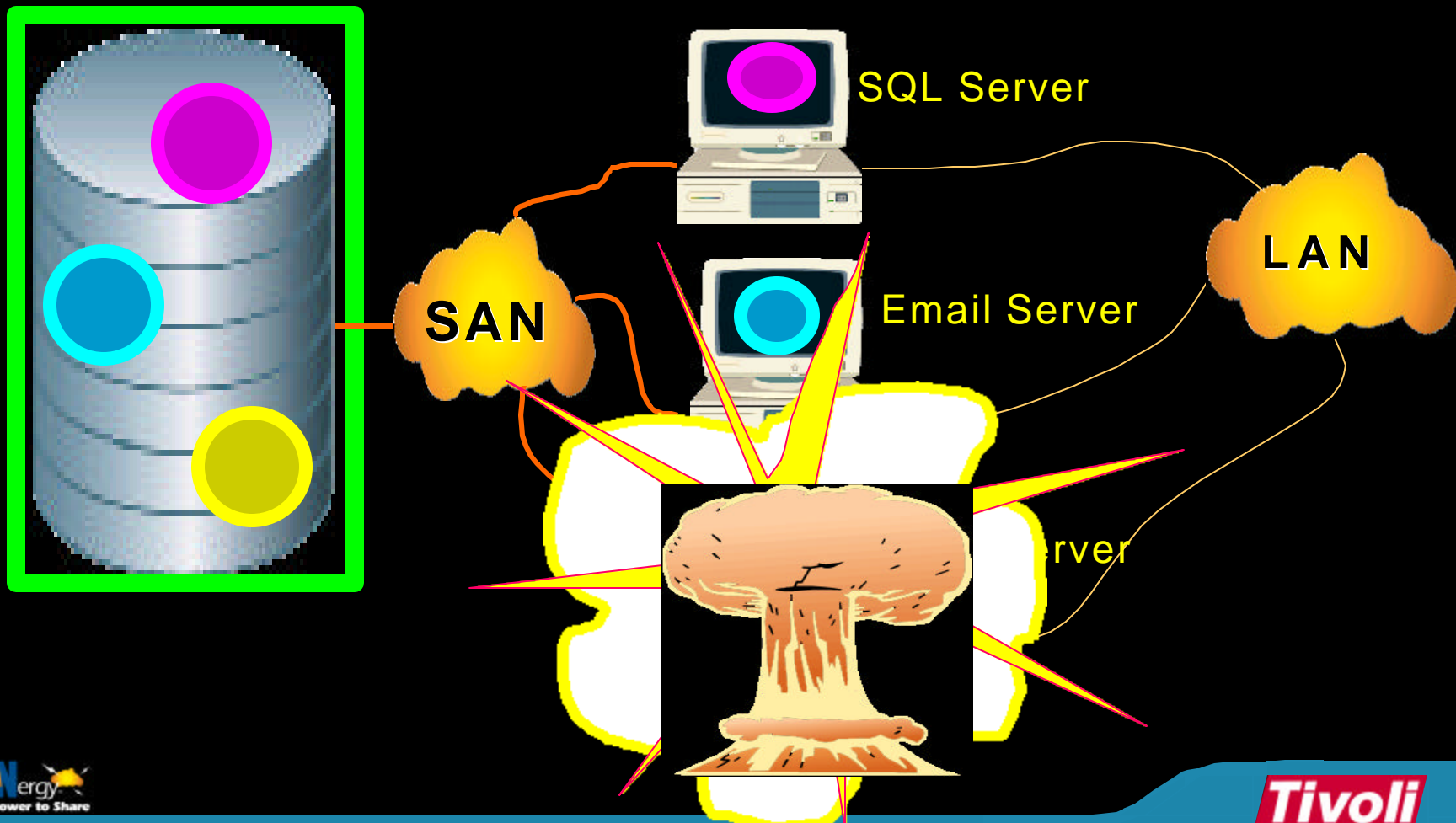
- Higher Bandwidth
- Less LAN traffic
- Less Processing

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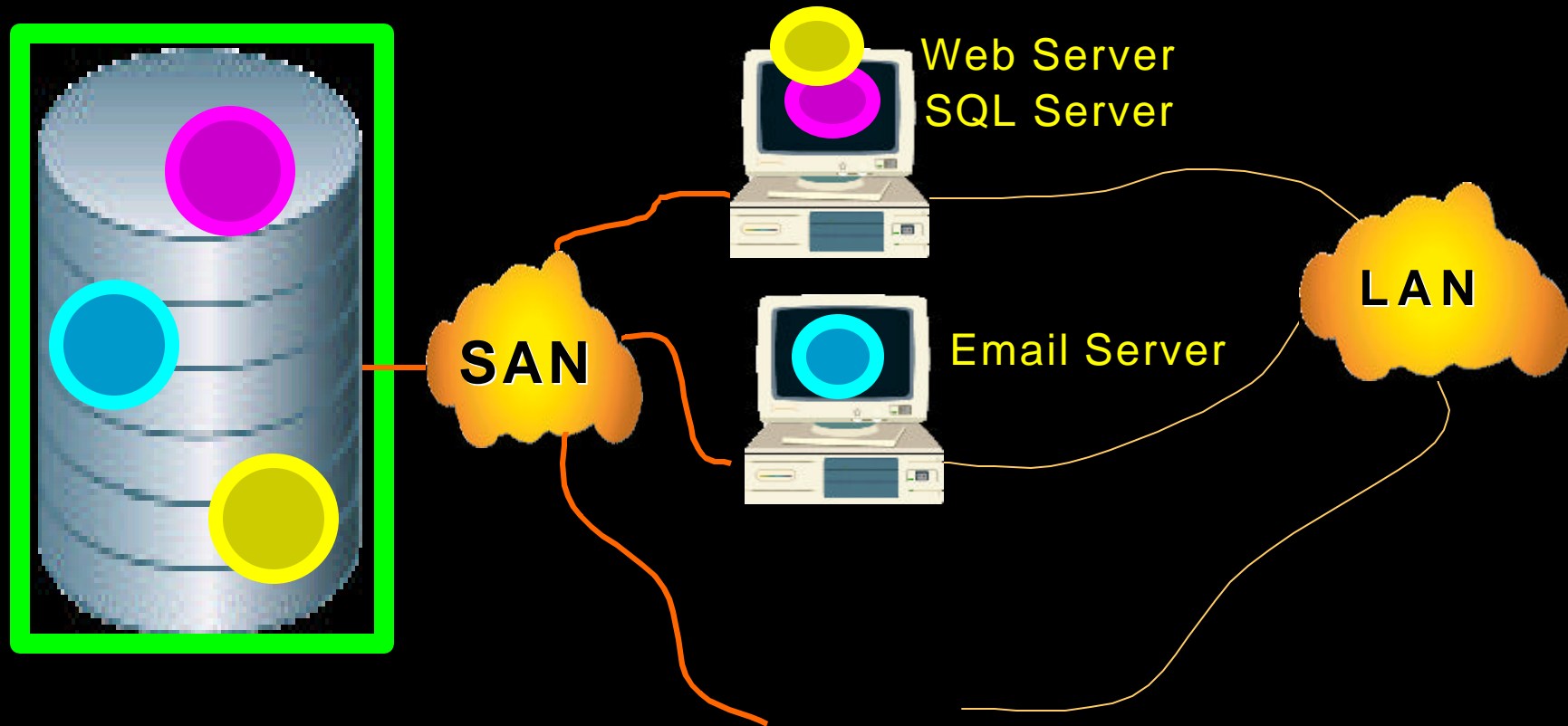
Higher Data Uptime

Oops!



Higher Data Uptime

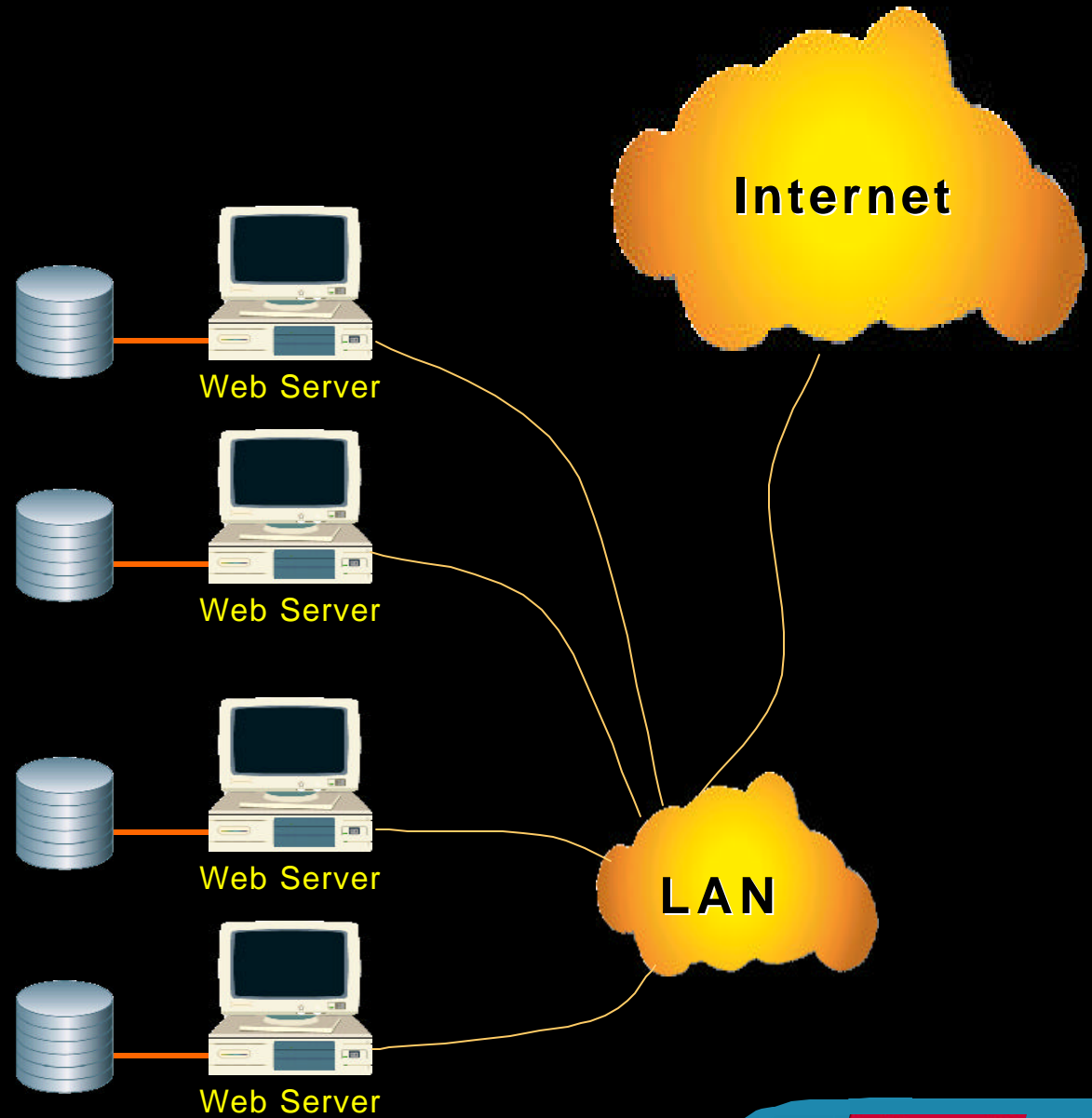
- All computers can see the same files
- Any other computer can run any other App



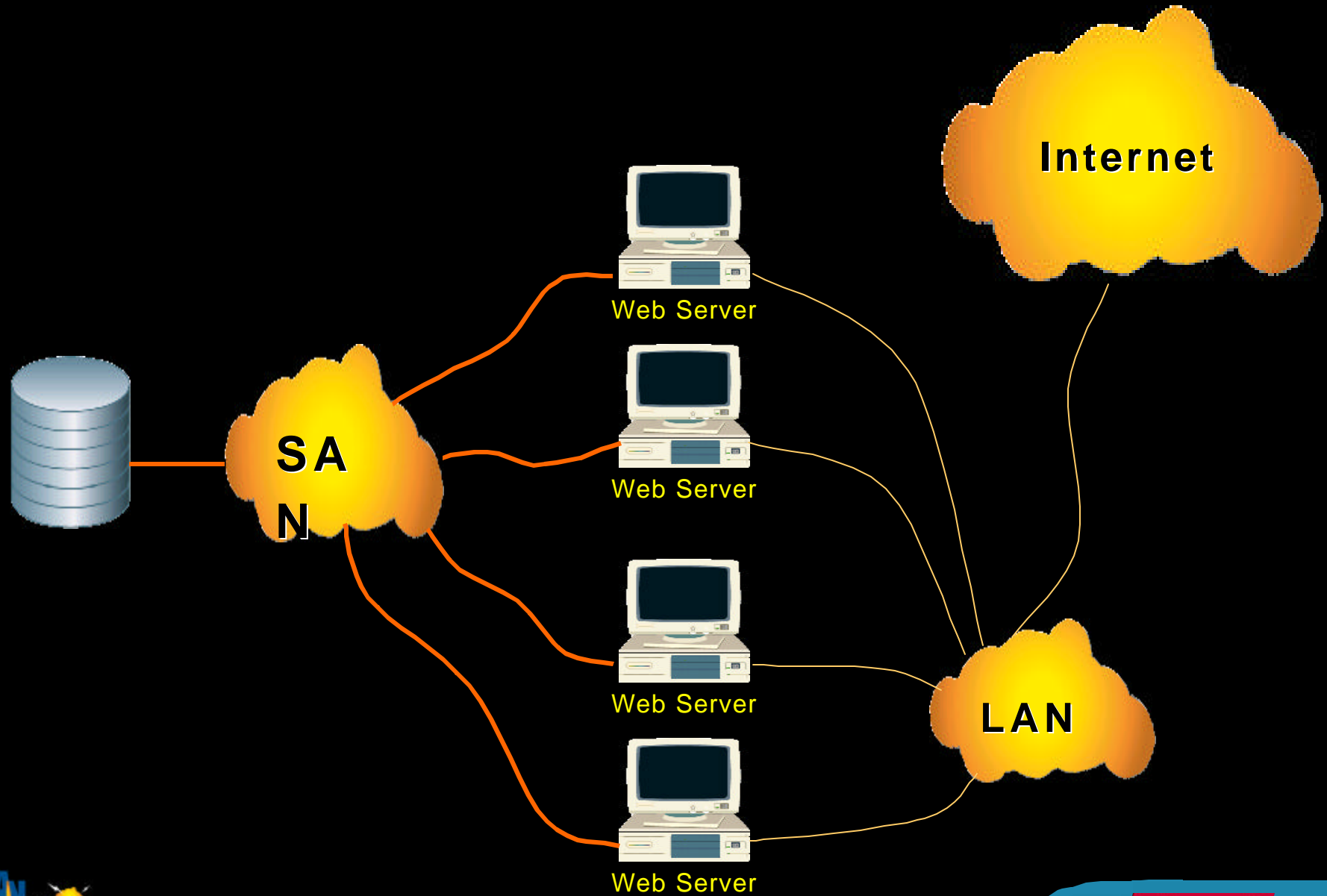
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Web Servicing





- Shipping since November 98
- 5,000+ licenses sold
- Win NT4
- Win 2000
- Solaris
- MacOS
- AIX
- Tru64
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- DG/UX

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SANergy™
The Power to Share



Added Features of SANergy 2.2

- Linux Host + Meta Data Controller (MDC)
- DG/UX Host
- All MDCs now support all hosts
- Improved MacOS support
- Zoom on Linux and Solaris SANs