



Tarantella® Enterprise II Administration

Transparency Masters

Course Release: 1.0

For Software: Tarantella Enterprise II

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Introduction to Tarantella

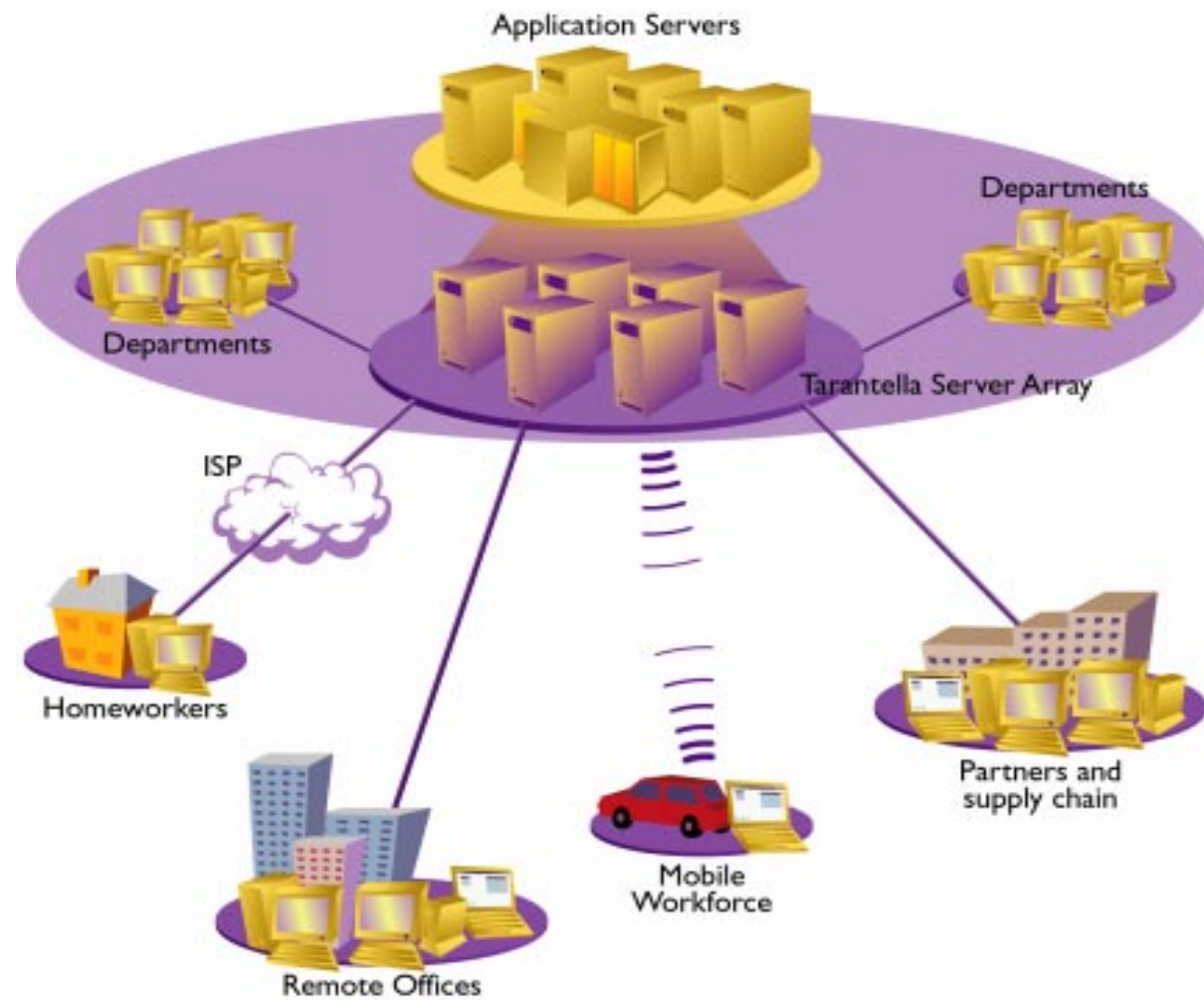
- Understanding the format of this course
- Logging into Tarantella
- Using the Webtop
- Logging out of Tarantella
- Locating Tarantella Help



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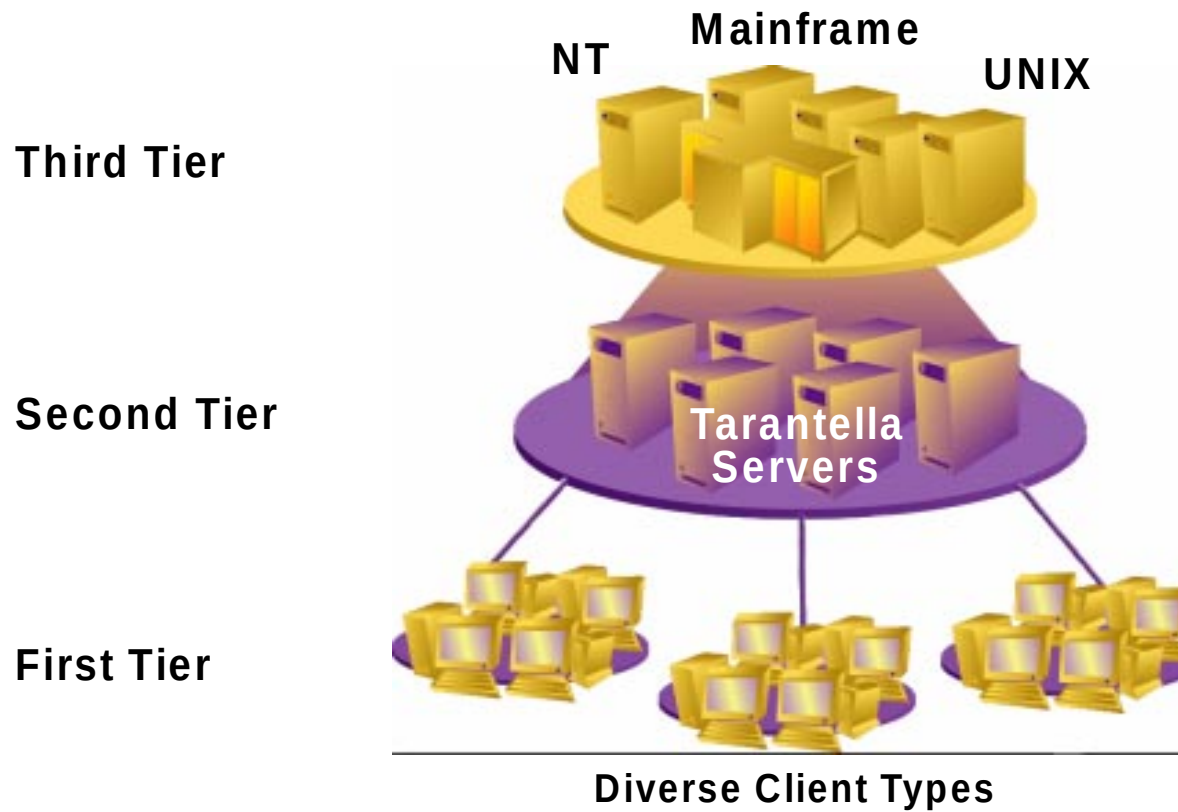
Tarantella at Work



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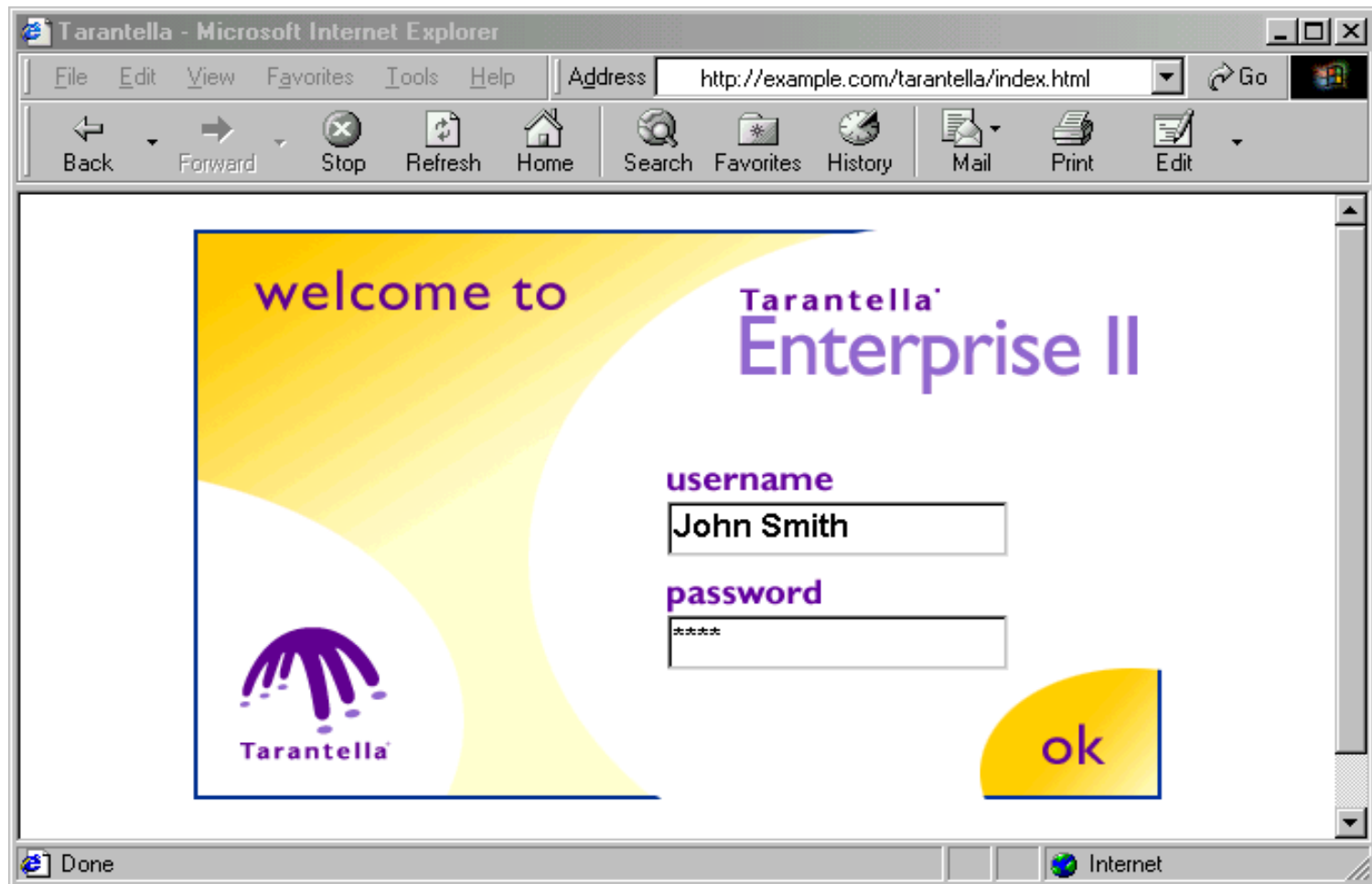
Tarantella's Three Tier Architecture



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The Tarantella Enterprise II Login Screen



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The Tarantella Enterprise II Webtop

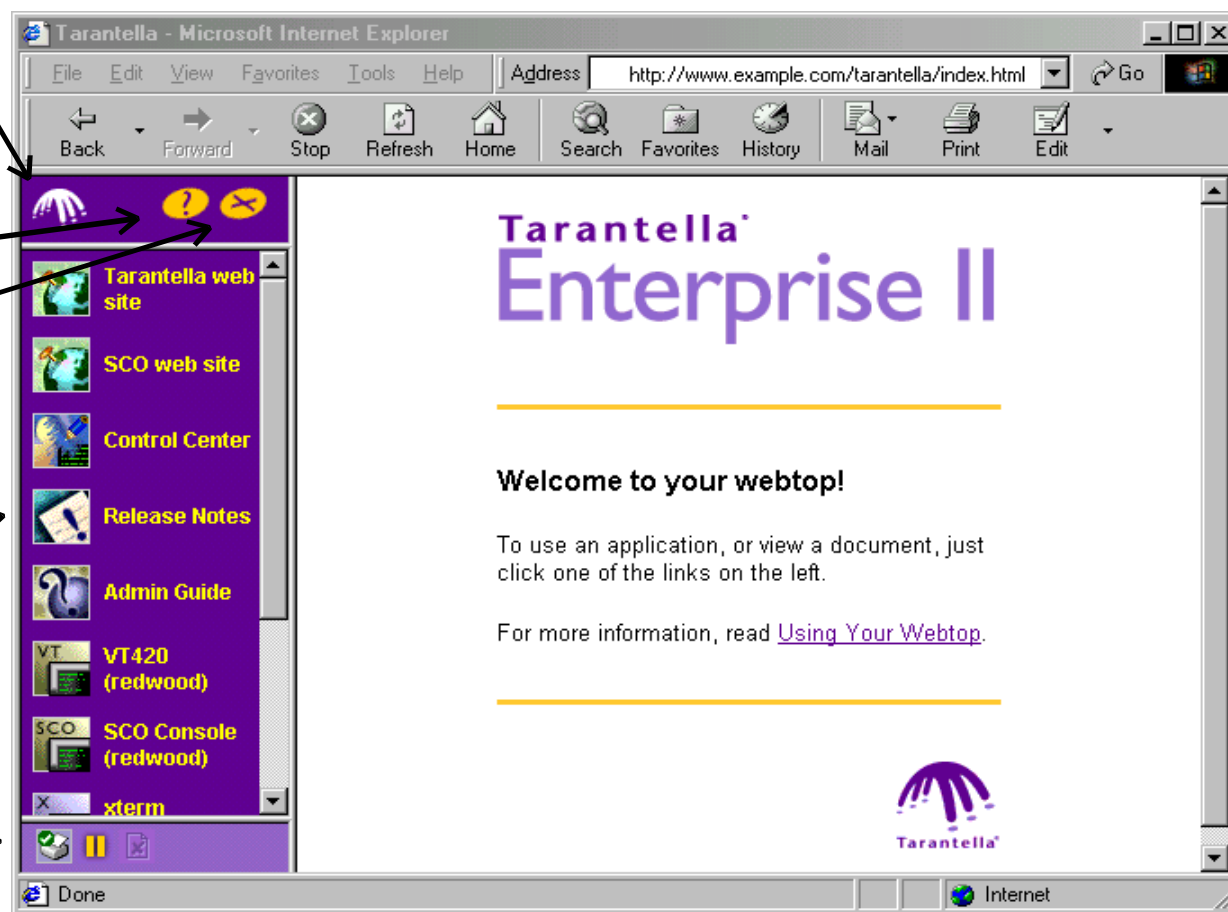
About Tarantella

Help

Logout

Launch Pad

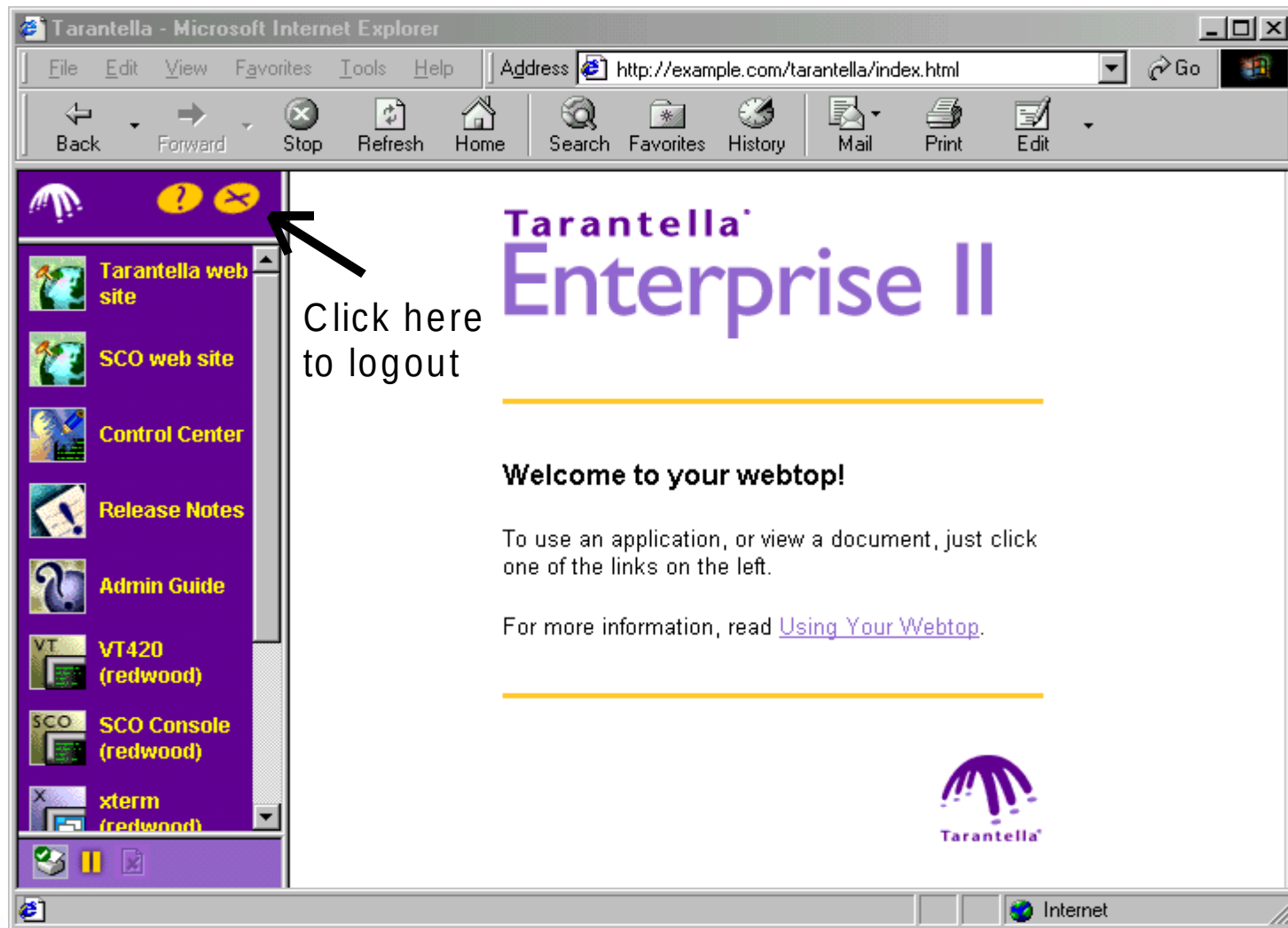
Printing



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Logging out of Tarantella Enterprise II



Tarantella Help

Tarantella - Microsoft Internet Explorer

Address: <http://example.com/tarantella/>

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit

Tarantella Control Center on redwood.

Organization

Attributes for Tarantella Web Doc

Object Name: Tarantella Web Doc

Label: Tarantella web site

Icon: Web Site

URL: <http://tarantella.sco.com>

New Browser Window: ☐

Pin Apply Reset

Loading...

Control Center Assistant

What do you want to do?

- [Solve a user's problem](#)
- [Let a new user log into Tarantella](#)

Applet started

Internet



Installing Tarantella

- Installing Tarantella
- Web Server Configuration
- Connecting to Tarantella



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The Tarantella Express Webtop

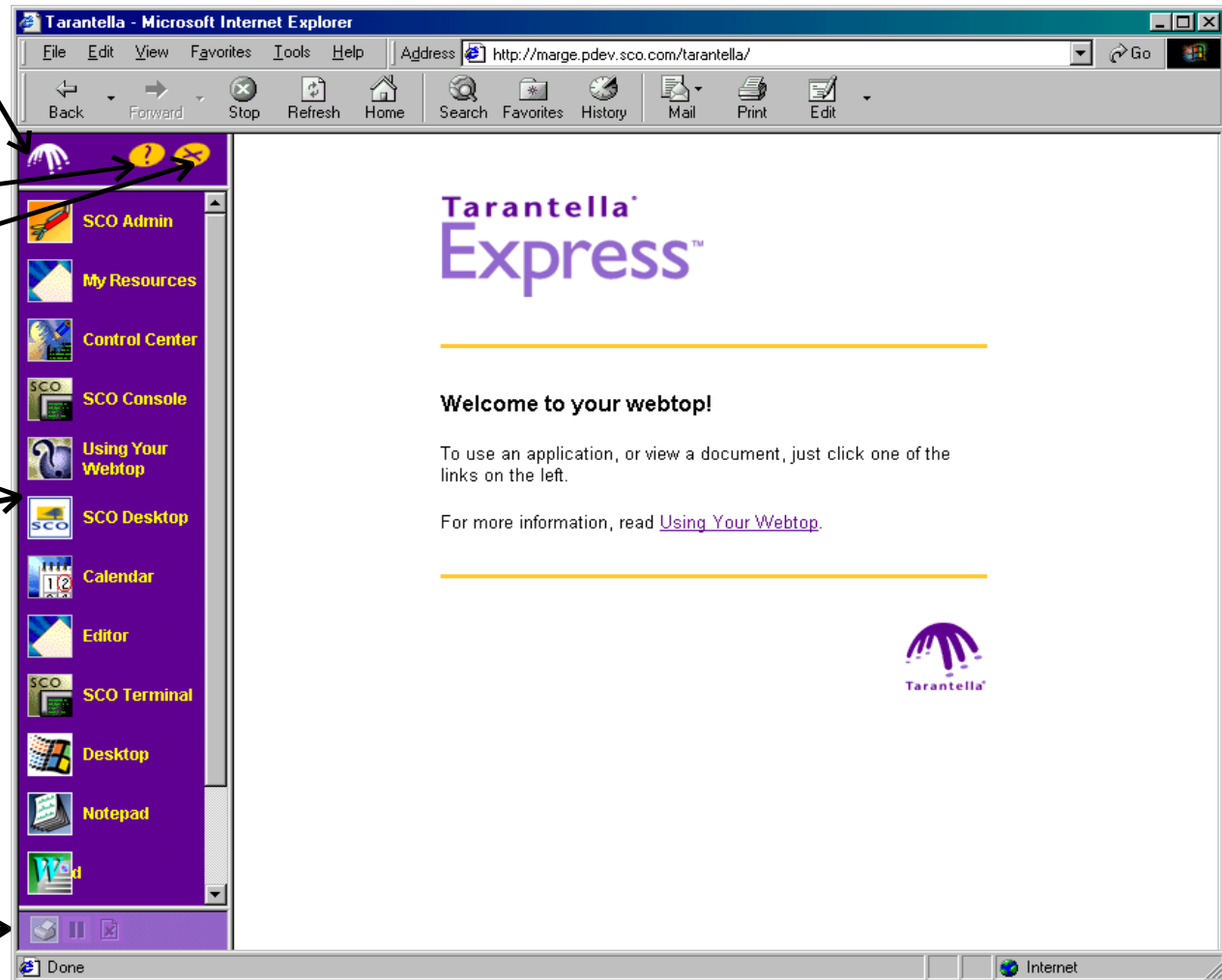
About Tarantella

Help

Logout

Launch Pad

Printing



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Modeling an Organization

- Creating Objects
- Modeling an Organization
- Administering Objects



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The Control Center

Hierarchy pane

Details pane

Hierarchy view list

Parents box

Children box

Status bar

Details view list

Point help

Progress indicator

Tarantella Control Center on redwood.

Organization ▼

Organization

root

Tarantella server

Control Center Doc

RNotes Doc

Applications

Admin Doc

Native Client Doc Viewer

SCO Web Doc

UserLinks

Click Me! Doc

Notepad

Solitaire

* Attributes for root ▼

Object Name: root

Label: root

Icon: Person ▼

Authenticate Using: (Automatic)

Webtop Theme: Use parent's theme ▼

Home Page:

Preferred Locale: (Automatic) ▼

Connection Type:

Keymap File:

Click to apply your changes now.

Pin Apply Reset

Loading...

?



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The Tarantella Native Client

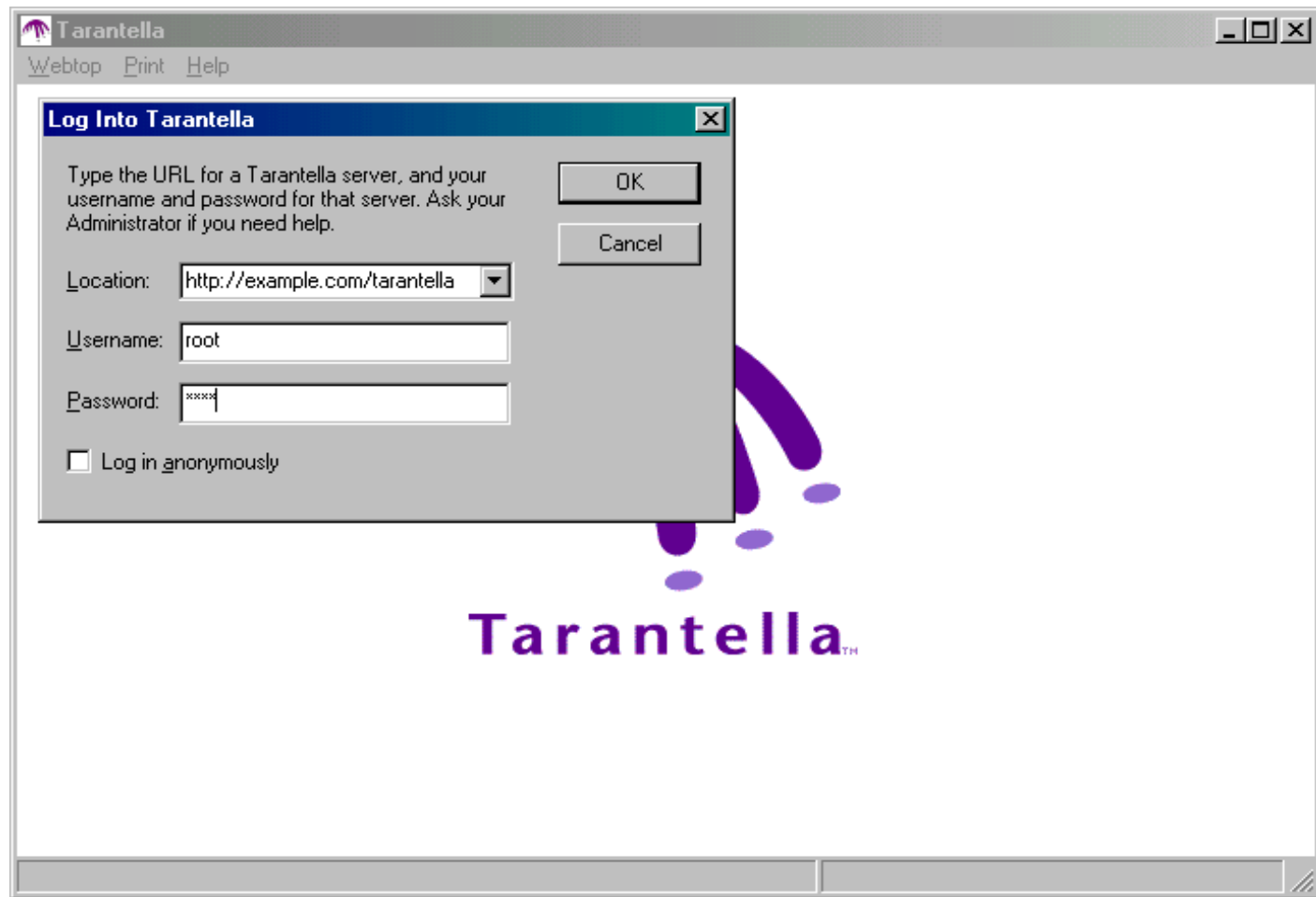
- Installing the Native Client
- Running the Native Client
- Logging in via the Native Client



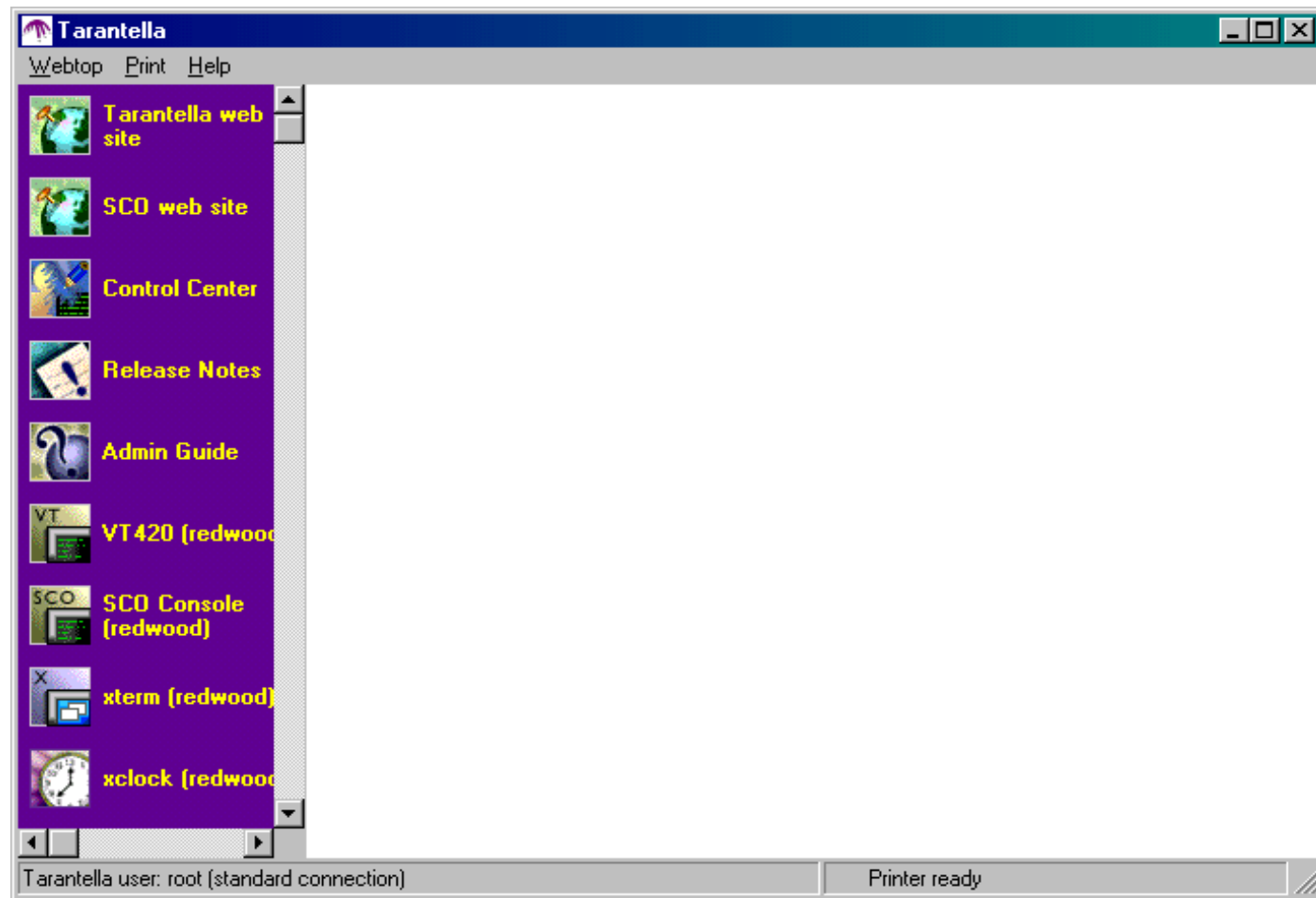
©The Santa Cruz Operation, Inc.



Logging into Tarantella via the Native Client



The Tarantella Native Client Webtop



Printing under Tarantella

- How Tarantella Printing Works
- Configuring a Printer
- Submitting Print Jobs under Tarantella



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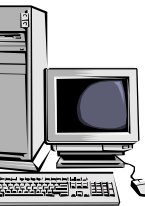
How Tarantella Printing Works

Third Tier



Application
Server

LPD



Tarantella
Server

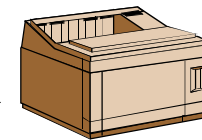
Second Tier

Print Protocol
Engine (PPE)



First Tier

Parallel
Serial
SMB
LPD
HP Jet Direct
Etc.



Printer



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The Tarantella Security Pack

- Installing the Tarantella Security Pack
- Obtaining an X.509 Certificate
- Installing an X.509 Certificate
- Enabling the Tarantella Security Pack



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The Tarantella Certrequest Command

```
# ./tarantella security certrequest --orgname "Example Co, Inc." --country "US"
--state "California"
```

The certificate's common name (CN) will be: redwood.example.com

This hostname is included in the certificate signing request (CSR) and corresponds to the name of the server that users will connect to.

- If DNS names are used to connect to the server, the hostname above MUST be a fully qualified DNS name.
- If clients are required to connect to the server using an IP address, the hostname above should be the IP address. A DNS record for this IP address SHOULD NOT exist.

For clients to accept the certificate once it's installed, a DNS lookup of the hostname followed by a reverse lookup of the result must return the original hostname.

The hostname to be used in the certificate request is redwood.example.com.

```
Do you want to use this hostname? [yes]
4368 semi-random bytes loaded
Generating RSA private key, 1024 bit long modulus
....+++++
*****+++++
e is 65537 (0x10001)
```

Verify that this
host name is
correct

Certificate Signing Request (CSR): Summary

```
Subject:
C=US
ST=California
O=Example Co, Inc.
CN=redwood.example.com
```

The information above will be contained in the CSR.

Create CSR now? [yes]

Send the following Certificate Signing Request (CSR) to a Certificate Authority, such as VeriSign (www.verisign.com). Check with your CA that you're providing all the information they need.

```
-----CUT HERE-----
-----BEGIN CERTIFICATE REQUEST-----
MIIBIzCCAQAQAQAwVzELMAkGA1UEBhMCVVMxEzARBgNVBAgTCkNhbmG1mb3JuaWEX
GTAXBgNVBAoTEEV4YV1wbGUgQ28sIEluYy4xGDAWBgNVBAMTD3JlZHVb2Quc2Nv
LmNvbTCBnzANBzKqhk1G9w0BAQEFAADBJQAwgYkCgYEA1W+qbAh5JTQAQFSTxV2b
8JWcYe6wFFJgRt089QAQXOTGOFdr899yL4hyLqYEjX8HZe/qypV8gbE4LwTmRPSRm
G+IjaNq2EBEA3qdSuSHY8y2XMOvp/iKZQLQt+bNuneN1bDuyWQeWkA62i70IwPf
zhP0ot0K/qHdGALcteb/gekCAWEAAaAAMA0GCSqGSIb3DQEBBAUAA4GBAIdhk/Rv
z6ZterZb7I1Tr9gjVU5fyFtCVF/dcvBx8RKzFeD3Nb80iD7f1zvXL3UlyBoV/f/k
dCOMazAD8j3cbGII20vry9BKqbYYGmS1/++35h5RoamIqa8rV1tSF7HzCA42t901
GzUFGpCRpCOWDxAqV62NJ7//DzWEivv0NURp
-----END CERTIFICATE REQUEST-----
-----CUT HERE-----
```

Cut-and-paste
this into a file

When you receive your certificate, use 'tarantella security certuse' to install it.

For more information, see 'Tarantella Security Pack overview' in the Tarantella Administration Guide Index.

#



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The Tarantella Certuse Command

```
# ./tarantella security certuse < /tmp/cert
```

```
-----  
Certificate: Summary  
-----
```

```
Subject:
```

```
C=US  
ST=California  
O=Example Co, Inc  
CN=devnull.uss.sco.com
```

```
Issuer:
```

```
C=ZA  
ST=FOR TESTING PURPOSES ONLY  
O=Thawte Certification  
OU=TEST TEST TEST  
CN=Thawte Test CA Root
```

```
Validity:
```

```
Not Before: Feb  3 07:45:42 2000 GMT  
Not After : Mar  5 07:45:42 2000 GMT
```

```
Key and certificate are compatible.
```

```
Successfully installed certificate.
```

```
#
```



Enabling Tarantella Security

```
# ./tarantella security on
Tarantella server stopped.
Starting Tarantella 1.41.901 from /opt/tarantella/bin/i3sc0325...
....OK
Checking whether to use secure connections...
Starting Tarantella Security Daemon from /opt/tarantella/bin/i3sc0325...
Secure Daemon exec: listening on 5307 forwarding to 3144

...OK
Tarantella Security Pack now enabled.
# █
```



Configuring the Connection Type

Tarantella Control Center on devnull.uss.sco.com:80

Organization: John Smith

* Attributes for John Smith

Object Name: John Smith

Label: John Smith

Each line specifies a connection type, based on the Tarantella server's and client device's DNS names or IP addresses (including wildcards), in the form 'server:client: type' (a colon separated list). Type can be 'deny' (deny access), 'std' (standard security) or 'ssl' (SSL security). Example: '*:192.168.5.*:ssl' gives SSL connections for those client IP addresses to any Tarantella server. The first matching entry is used. If no match is found, the parent object's Connection Type attribute is considered.

Connection Type: *:SSL

Keymap File: (Automatic)

Pin Apply Reset

Loading...

Control Center Assistant

Applet started Internet



Free Certificate Warning



Tarantella SSL Login Screen



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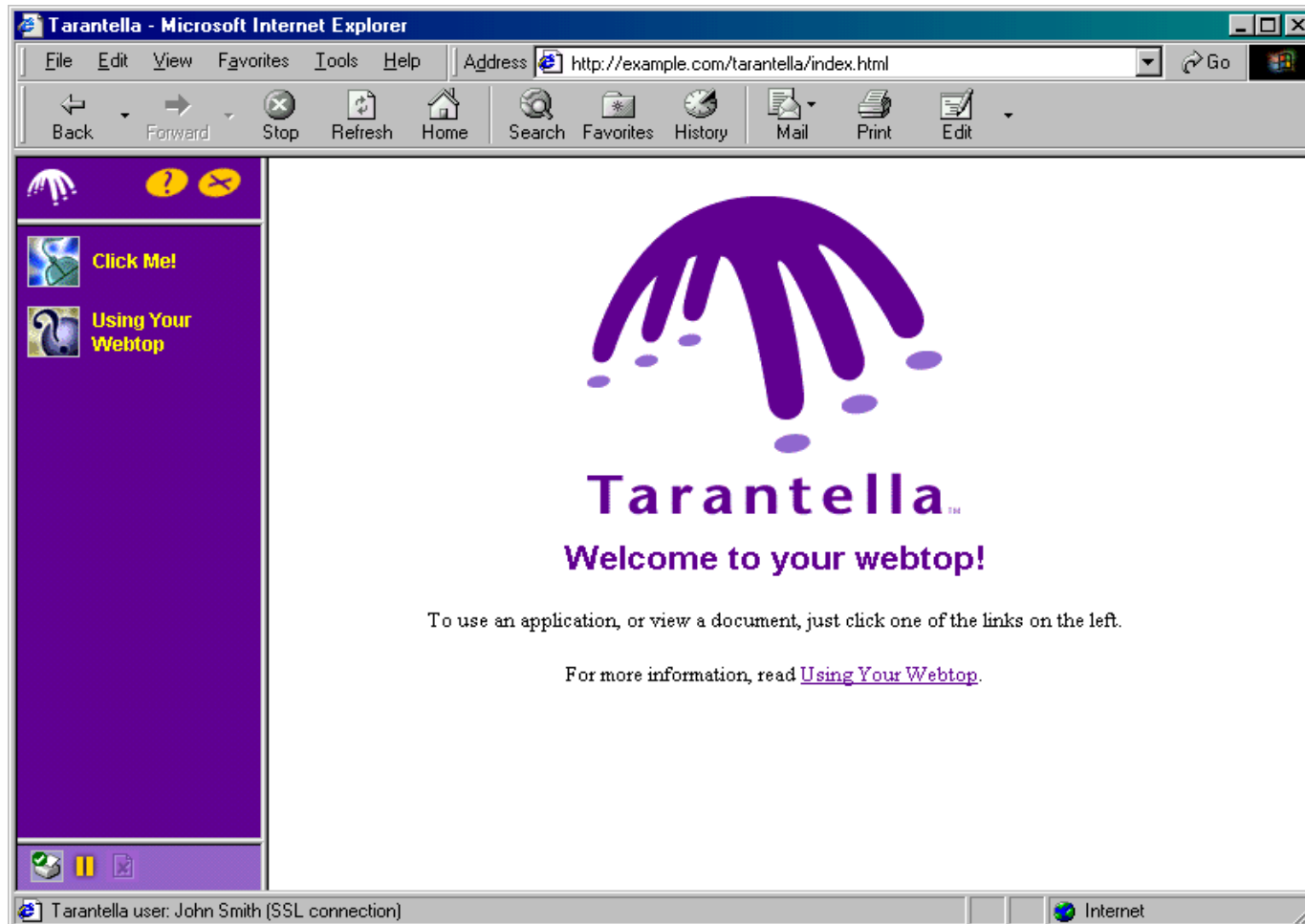
A Non-SSL Tarantella Login



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An SSL Tarantella Login



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Tarantella Load Balancing

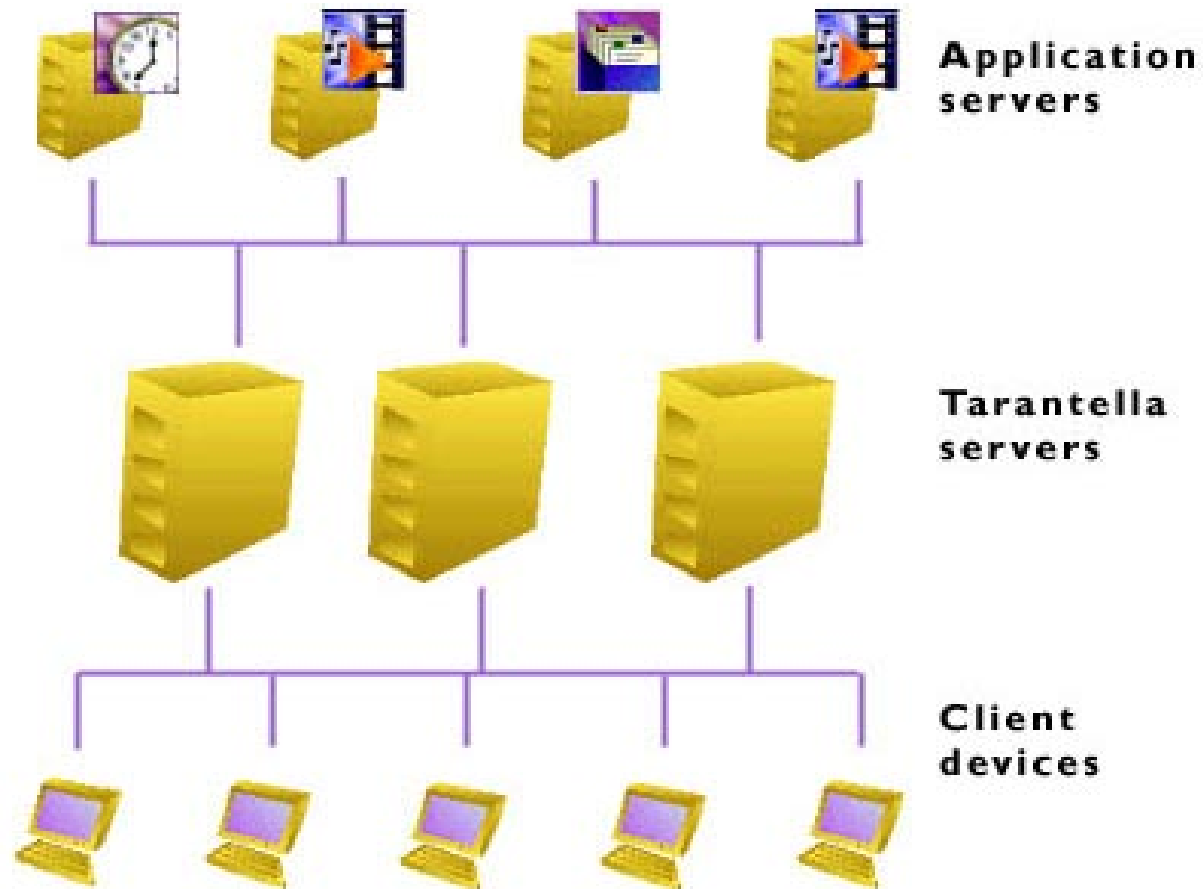
- Understanding Tarantella Load Balancing
- Understanding Tarantella Arrays
- Application Server Farms
- Understanding the Load Balancing Table



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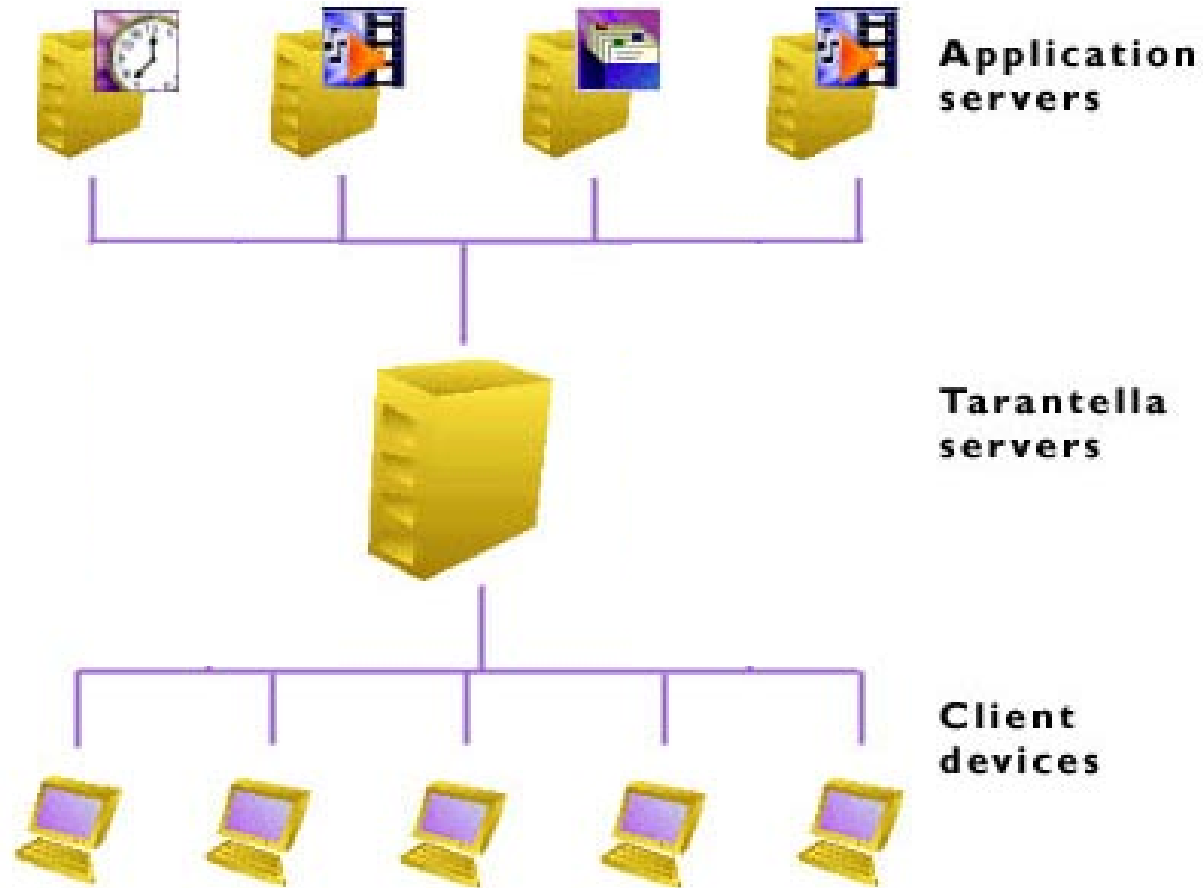
Tarantella Enterprise II



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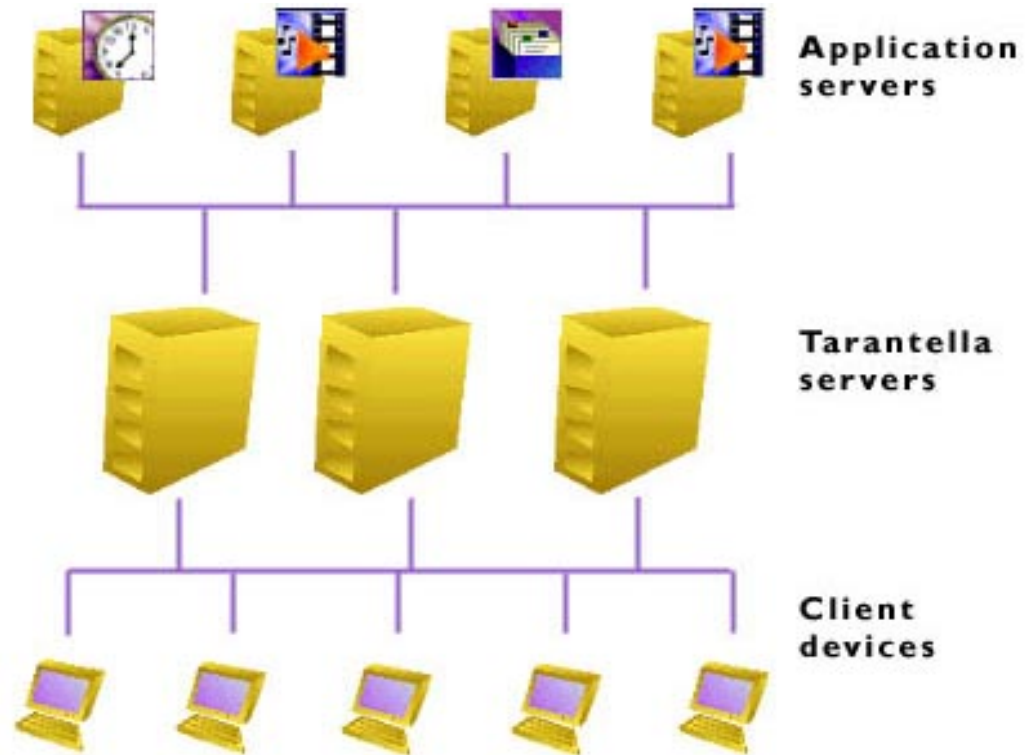
Tarantella Express



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Tarantella Load Balancing



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Creating a Tarantella Array

```
# tarantella array join --primary scoffee.uss.sco.com --secondary milano.uss.sco.com
Adding server scoffee.uss.sco.com to an array as the primary server.
Please log in as a Tarantella Administrator for milano.uss.sco.com
Username: root
Password:
Adding milano.uss.sco.com as a secondary server (primary: scoffee.uss.sco.com)
```



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Querying a Tarantella Array

```
# tarantella array query --summary
Name                               Users with sessions
scoffee.uss.sco.com (Primary)      0
milano.uss.sco.com                 0
```



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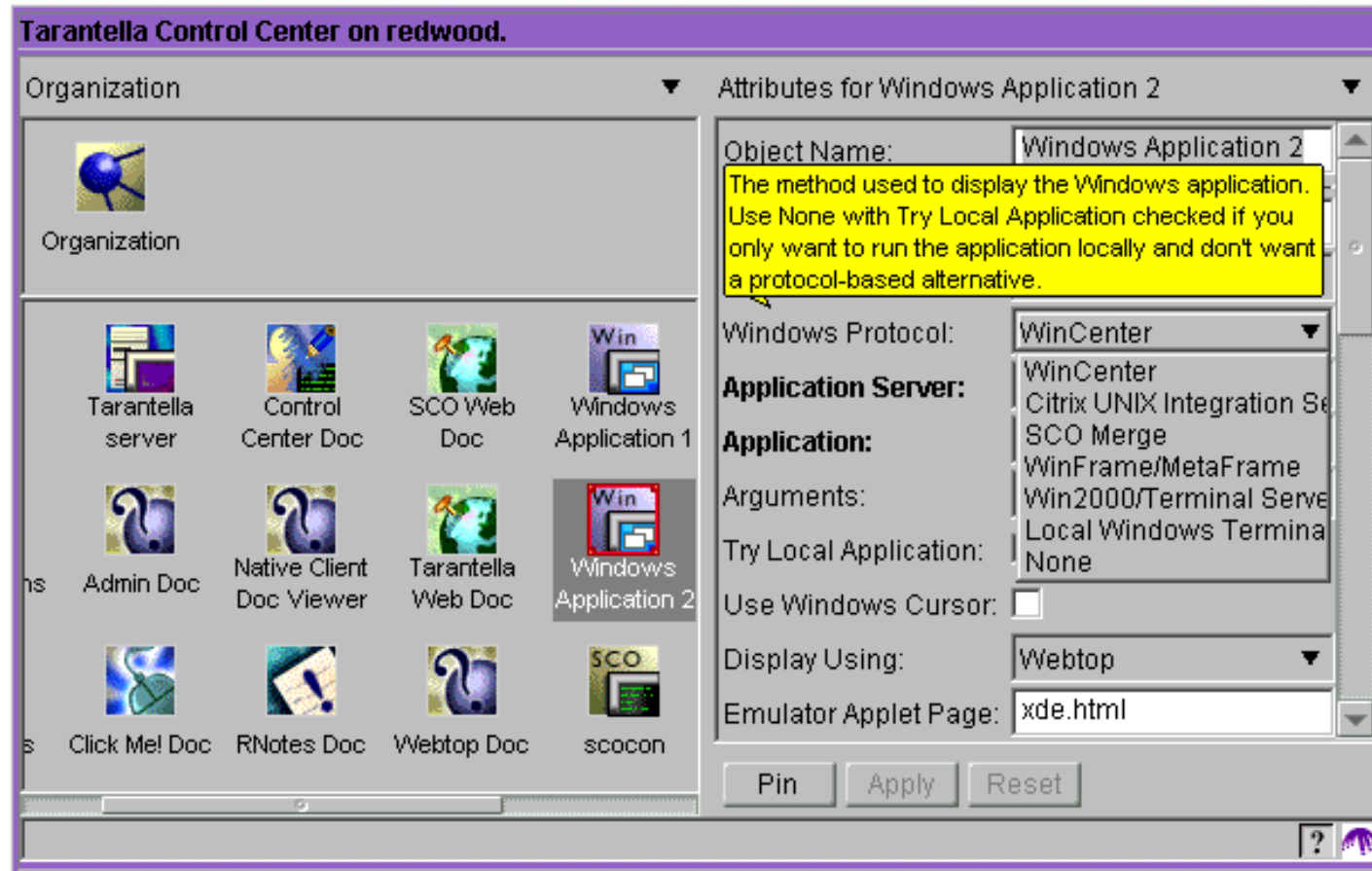


Windows Connectivity Pack

- Installing the Windows Connectivity Pack
- Installing Windows Terminal Server
- Basic Administration
- Connecting to Windows Terminal Server

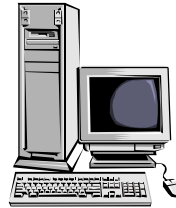


Selecting a Windows Protocol



The "None" Protocol

Second Tier



First Tier



Application runs
locally on client



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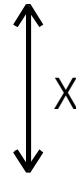


The "Merge" Protocol

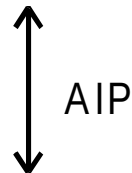
Third Tier



Application runs
on application
server under SCO
Merge



Second Tier

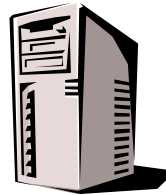


First Tier



The "WinFrame / MetaFrame" Protocol

Third Tier



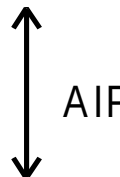
Application runs on
application server
under Citrix
WinFrame or Citrix
MetaFrame



Second Tier



ICA Viewer (an X
application) runs
on the Tarantella
server



First Tier



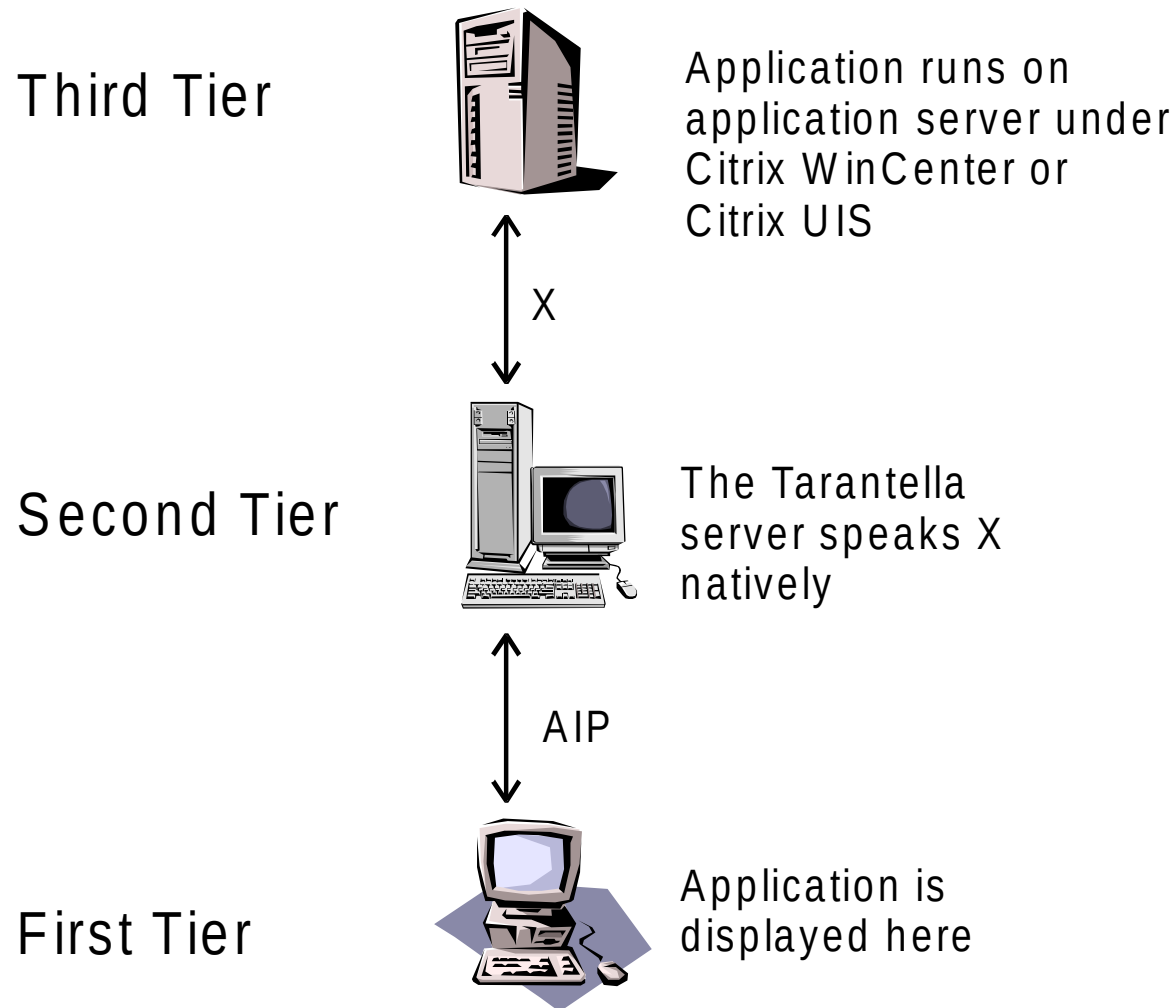
Application is
displayed here



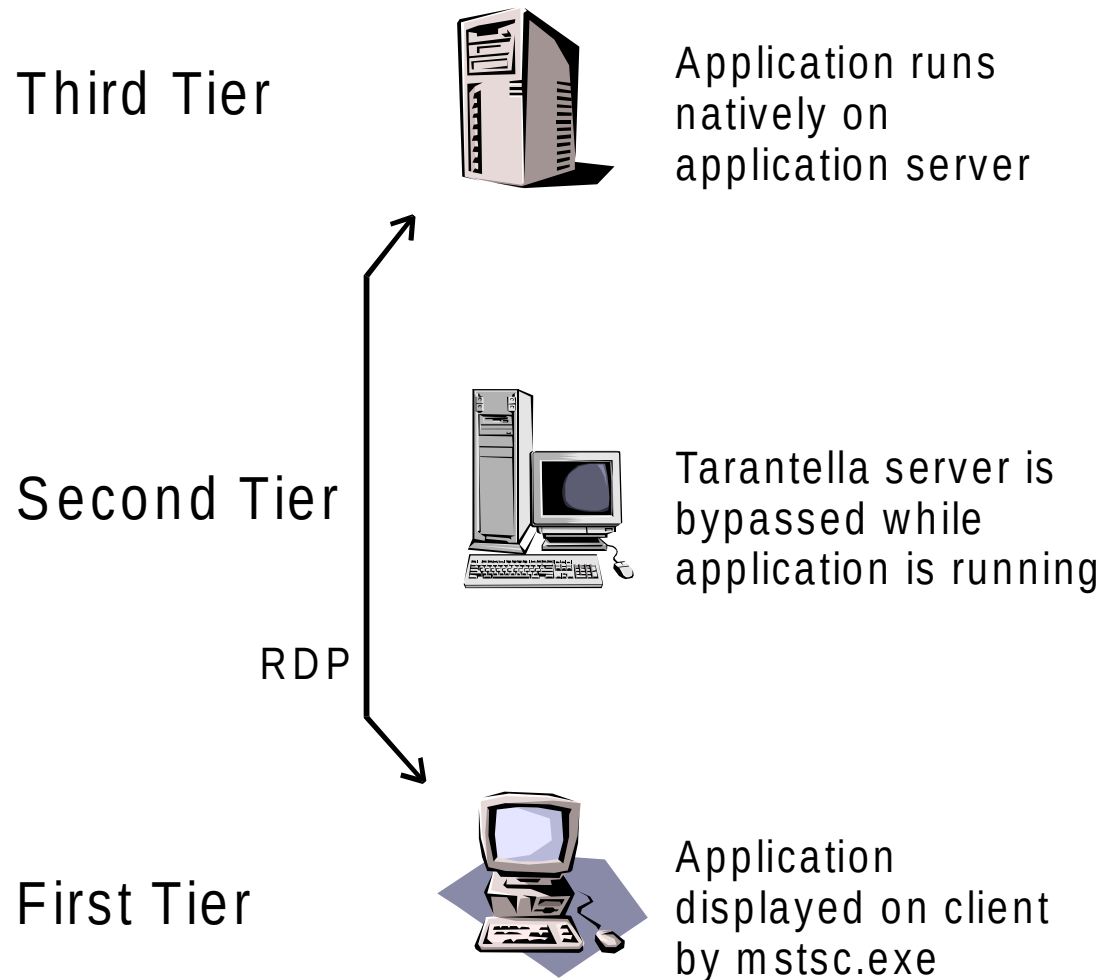
©The Santa Cruz Operation, Inc.



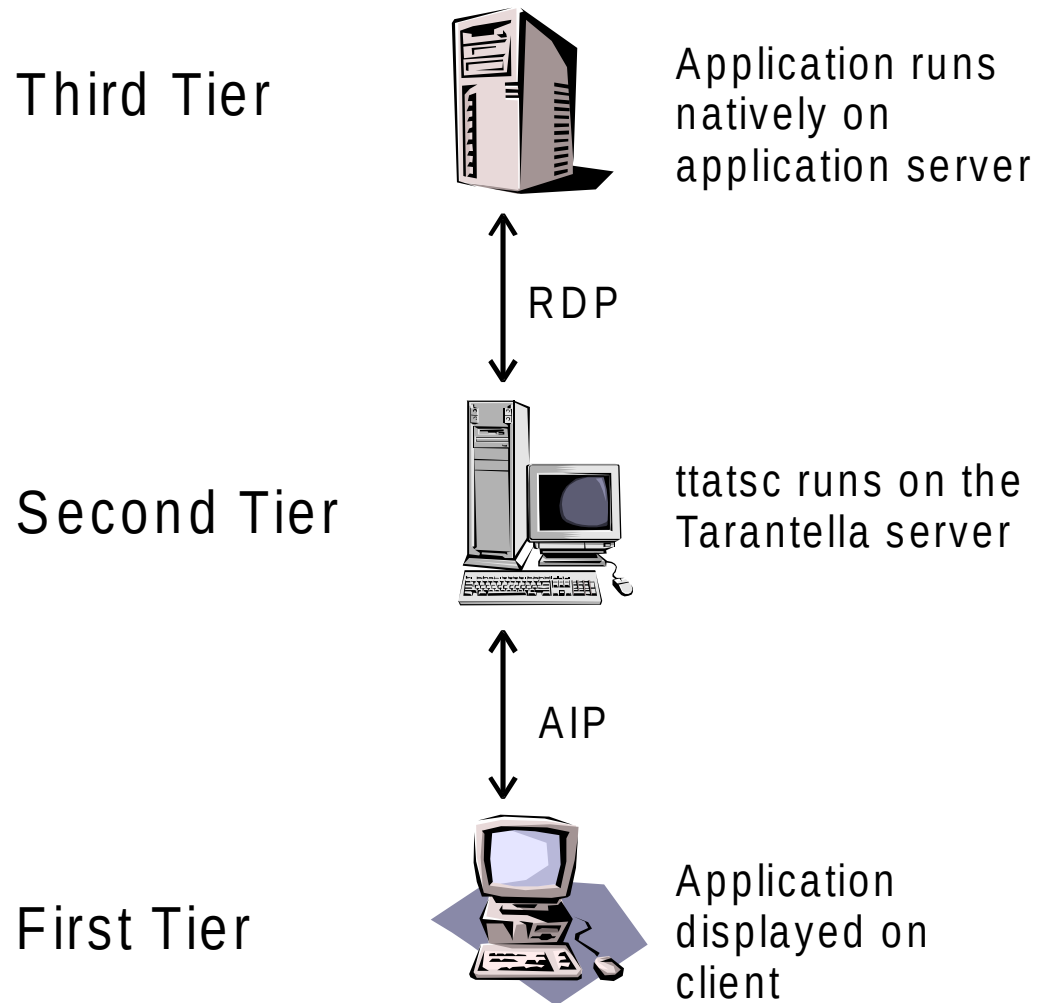
The "WinCenter" & "UIS" Protocols



The “Local Windows Terminal Server” Protocol



The "Win2000 / Terminal Server" Protocol



The X Window System

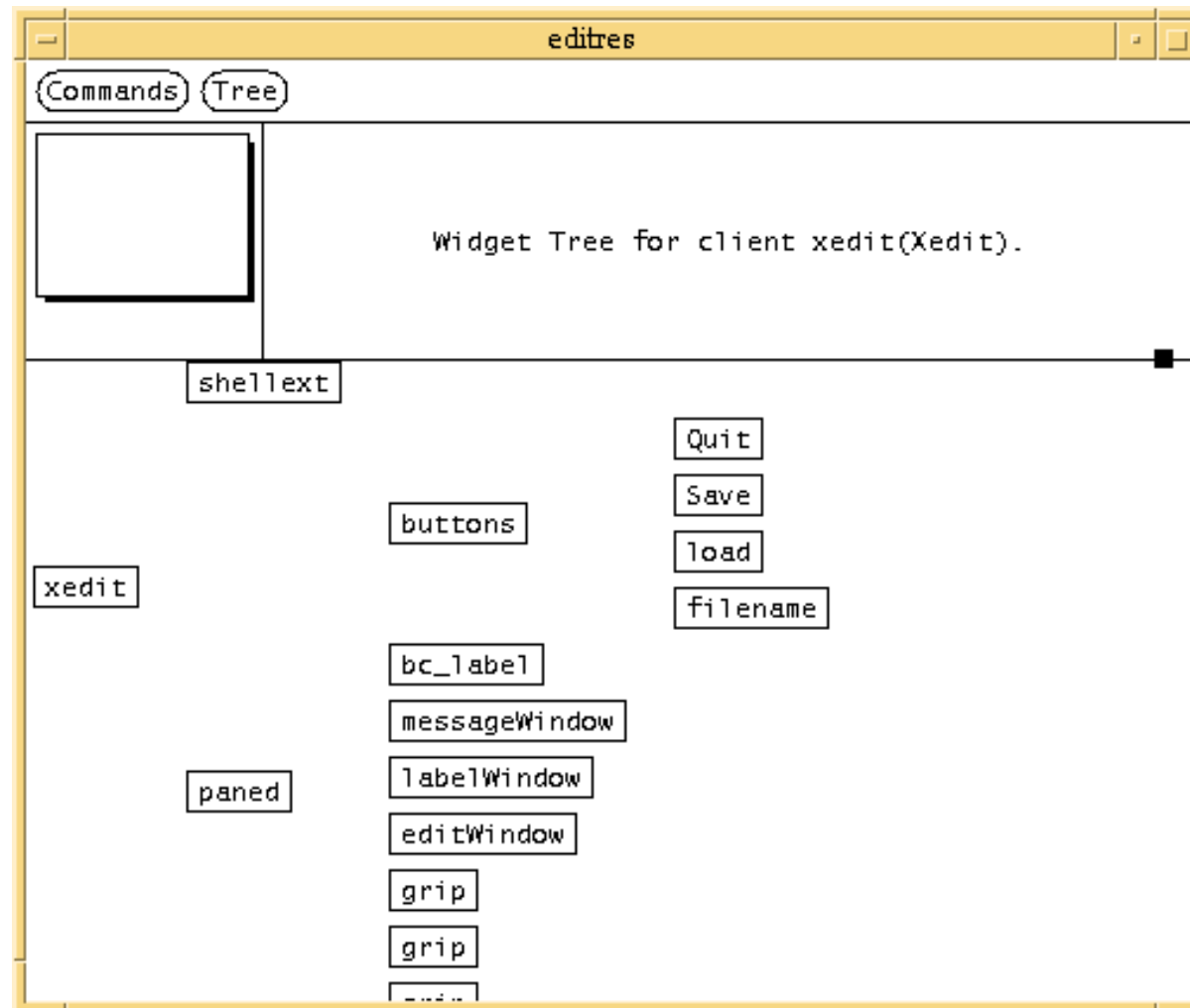
- History of the X Window System
- X Applications
- X Application Building Blocks



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Grabbing a Tree with editres



Changing the Save Button Color with editres

xt

.xedit.paned.buttons.save.background:

.xedit	.paned	.buttons	.save
Xedit	Paned	Paned	Command
Any Widget	Any Widget	Any Widget	Any Widget
Any Widget Chain	Any Widget Chain	Any Widget Chain	Any Widget Chain

Normal Resources: mb2 gets a value

accelerators	depth	label
ancestorSensitive	destroyCallback	leftBitmap
background	encoding	mappedWhenManaged
backgroundPixmap	font	pointerColor
bitmap	fontSet	pointerColorBackground
borderColor	foreground	resize
borderPixmap	height	screen
borderWidth	highlightThickness	sensitive
callback	insensitiveBorder	shapeStyle
colormap	internalHeight	translations
cornerRoundPercent	internalWidth	width
cursor	international	x
cursorName	justify	y

Constraint Resources

allowResize	min	preferredPaneSize	showGrip
max	position	resizeToPreferred	skipAdjust

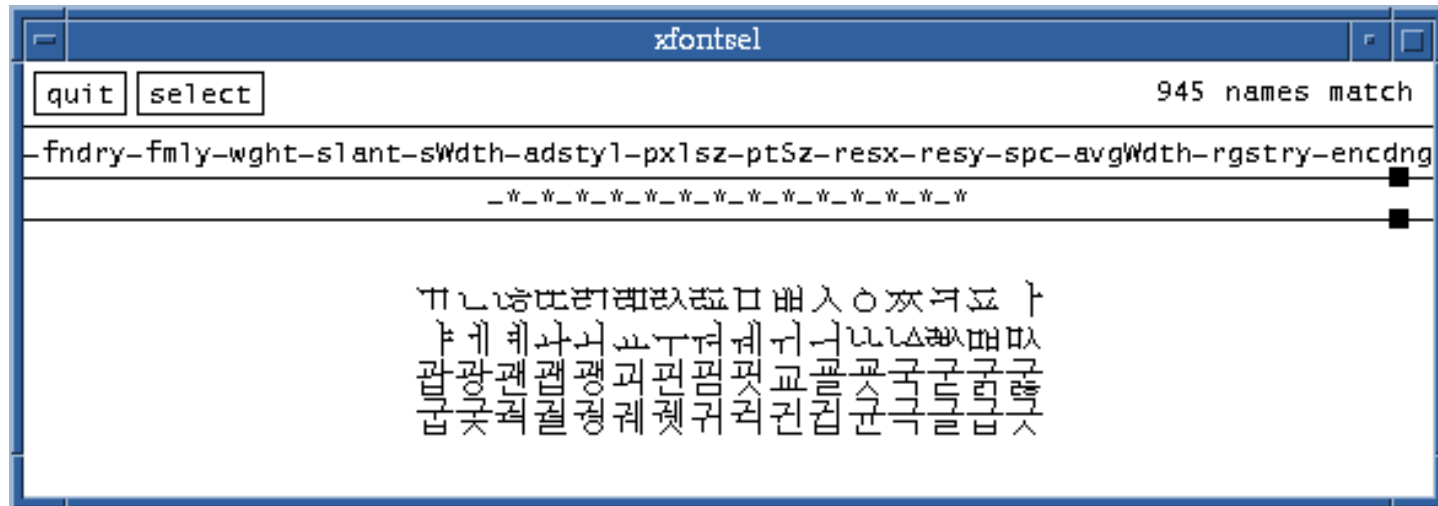
Enter Resource Value:

Set Save File Save Apply Save and Apply Popdown Resource Box

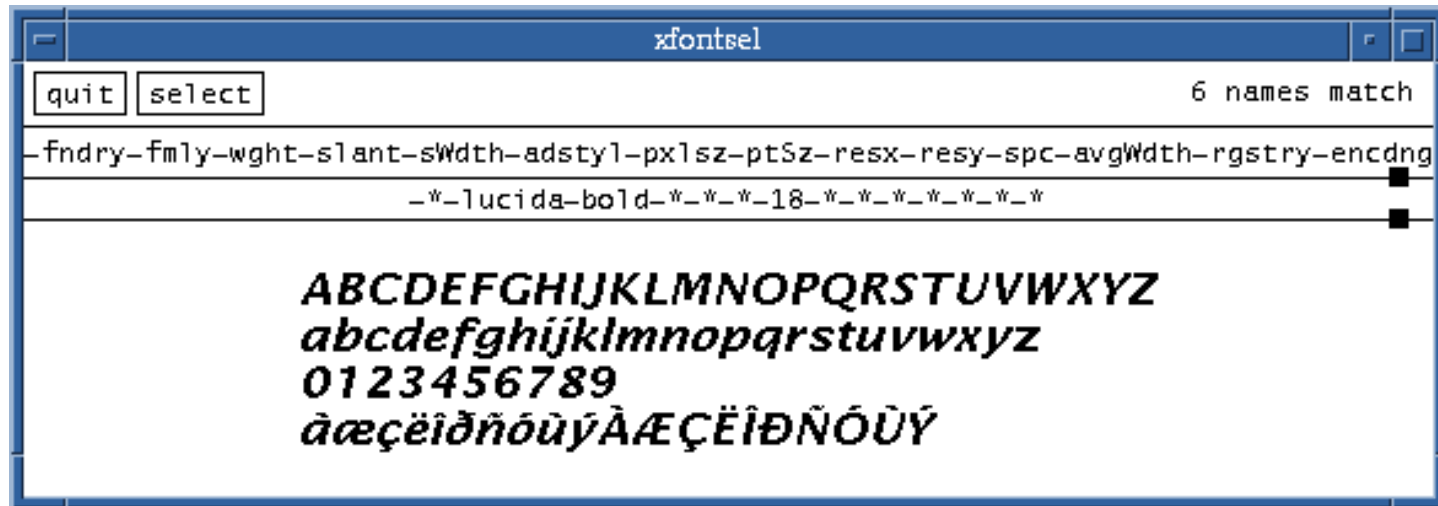
Type
"red"



Selecting Fonts with xfontsel



Selecting Fonts with xfontsel



Changing Fonts with editres

xt

.xedit.paned.buttons.save.font:

.	xedit	.	paned	.	buttons	.	save	.
*	Xedit	*	Paned	*	Paned	*	Command	*
	Any Widget		Any Widget		Any Widget		Any Widget	
	Any Widget Chain		Any Widget Chain		Any Widget Chain		Any Widget Chain	

Normal Resources: mb2 gets a value

accelerators	depth	label
ancestorSensitive	destroyCallback	leftBitmap
background	encoding	mappedWhenManaged
backgroundPixmap	font	pointerColor
bitmap	fontSet	pointerColorBackground
borderColor	foreground	resize
borderPixmap	height	screen
borderWidth	highlightThickness	sensitive
callback	insensitiveBorder	shapeStyle
colormap	internalHeight	translations
cornerRoundPercent	internalWidth	width
cursor	international	x
cursorName	justify	y

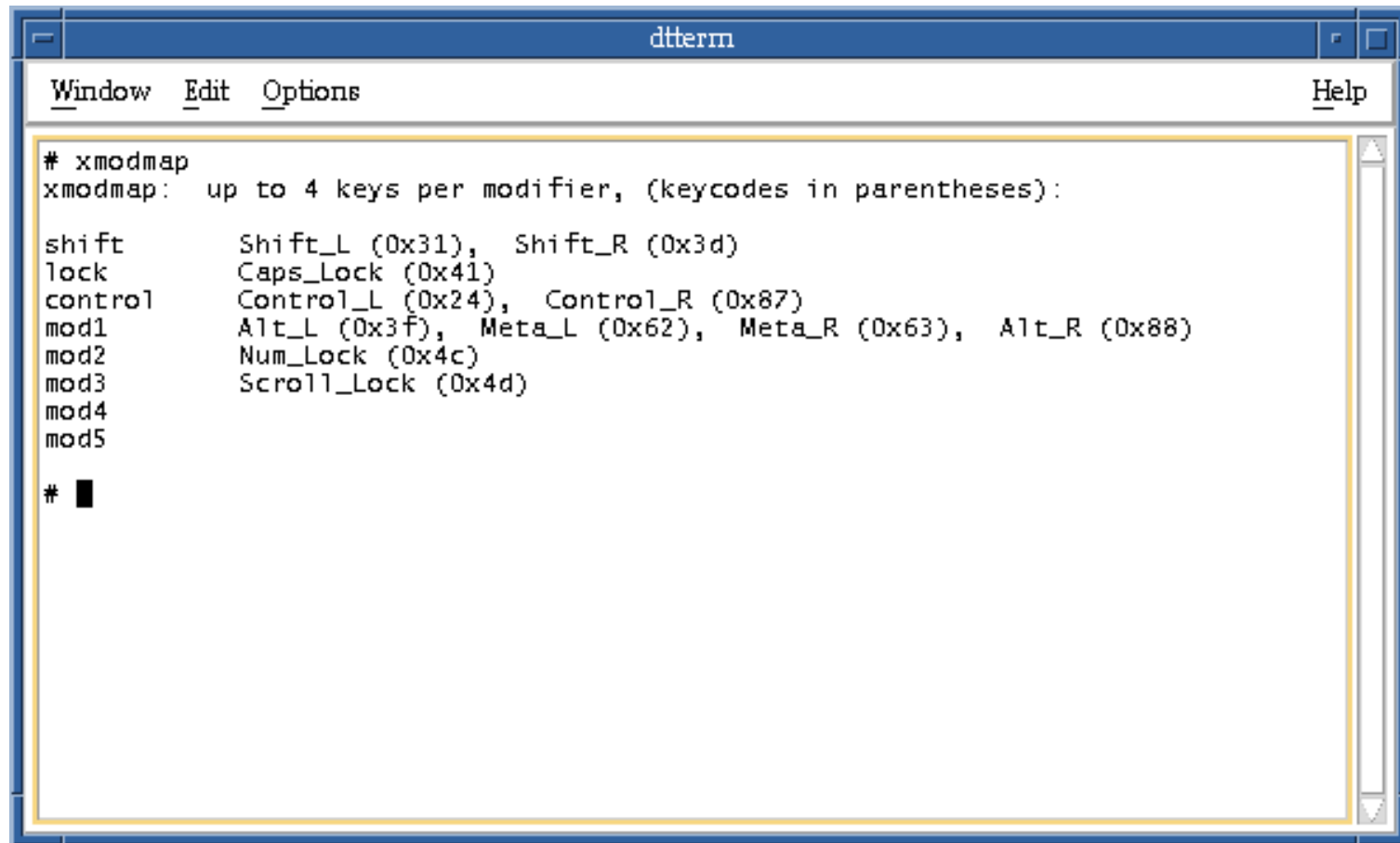
Constraint Resources

allowResize	min	preferredPaneSize	showGrip
max	position	resizeToPreferred	skipAdjust

Enter Resource Value:



Examining Key Mappings with xmodmap

A screenshot of a terminal window titled "dtterm". The window has a menu bar with "Window", "Edit", "Options", and "Help". The terminal displays the output of the xmodmap command, showing the mapping of modifier keys to their respective X11 keycodes. The output is as follows:

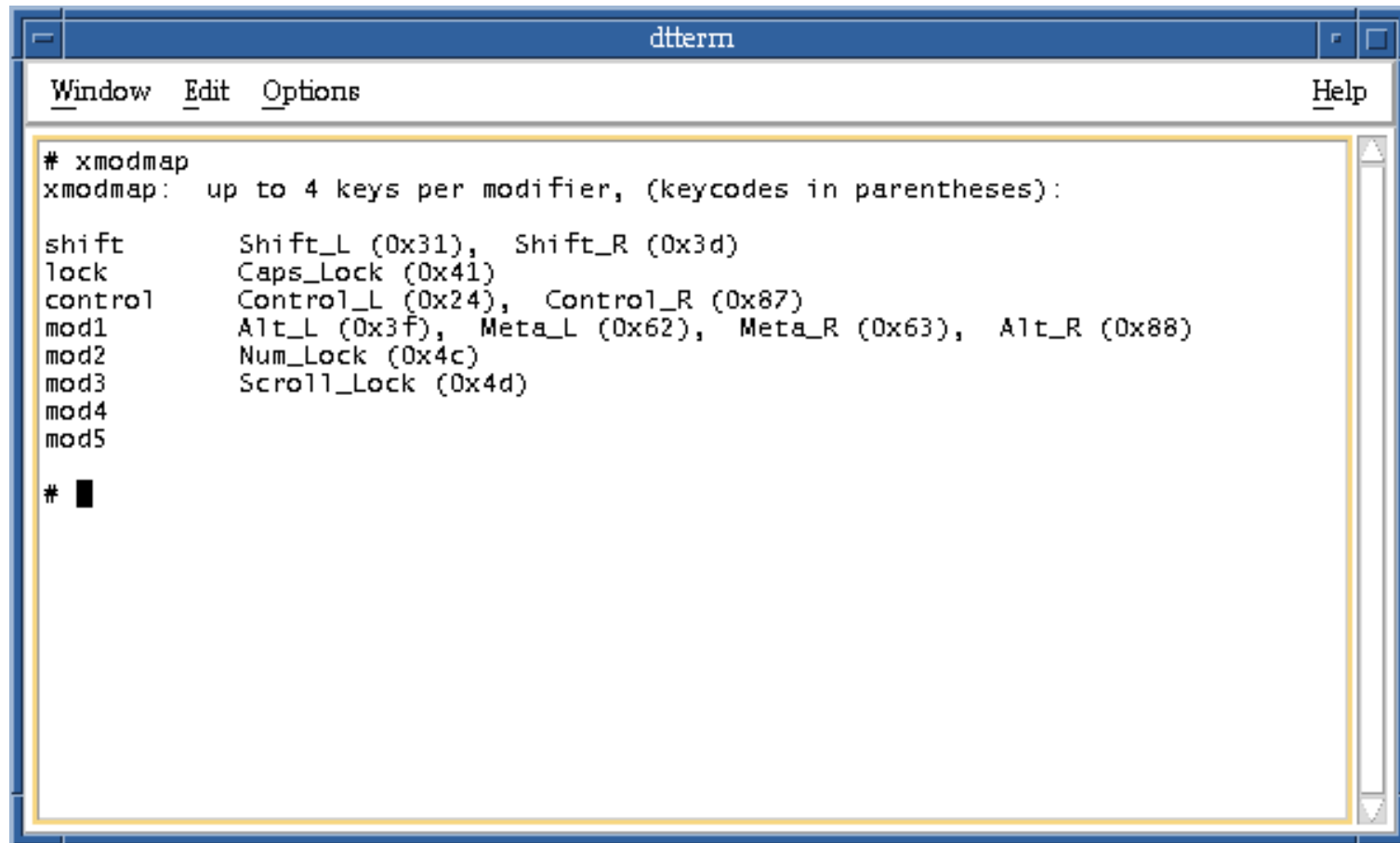
```
# xmodmap
xmodmap:  up to 4 keys per modifier, (keycodes in parentheses):

shift      Shift_L (0x31),  Shift_R (0x3d)
lock       Caps_Lock (0x41)
control    Control_L (0x24),  Control_R (0x87)
mod1       Alt_L (0x3f),  Meta_L (0x62),  Meta_R (0x63),  Alt_R (0x88)
mod2       Num_Lock (0x4c)
mod3       Scroll_Lock (0x4d)
mod4
mod5

# █
```



Examining Key Mappings with xmodmap

A screenshot of a terminal window titled 'dtterm'. The window has a menu bar with 'Window', 'Edit', 'Options', and 'Help'. The terminal displays the output of the 'xmodmap' command, showing the mapping of modifier keys to specific keycodes. The text is as follows:

```
# xmodmap
xmodmap:  up to 4 keys per modifier, (keycodes in parentheses):

shift      Shift_L (0x31),  Shift_R (0x3d)
lock       Caps_Lock (0x41)
control    Control_L (0x24),  Control_R (0x87)
mod1       Alt_L (0x3f),  Meta_L (0x62),  Meta_R (0x63),  Alt_R (0x88)
mod2       Num_Lock (0x4c)
mod3       Scroll_Lock (0x4d)
mod4
mod5

# █
```



The Tarantella Splash Screen

Tarantella[®] Enterprise II



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The Tarantella Login Screen

welcome to

Tarantella®
Enterprise II

username

password


Tarantella®

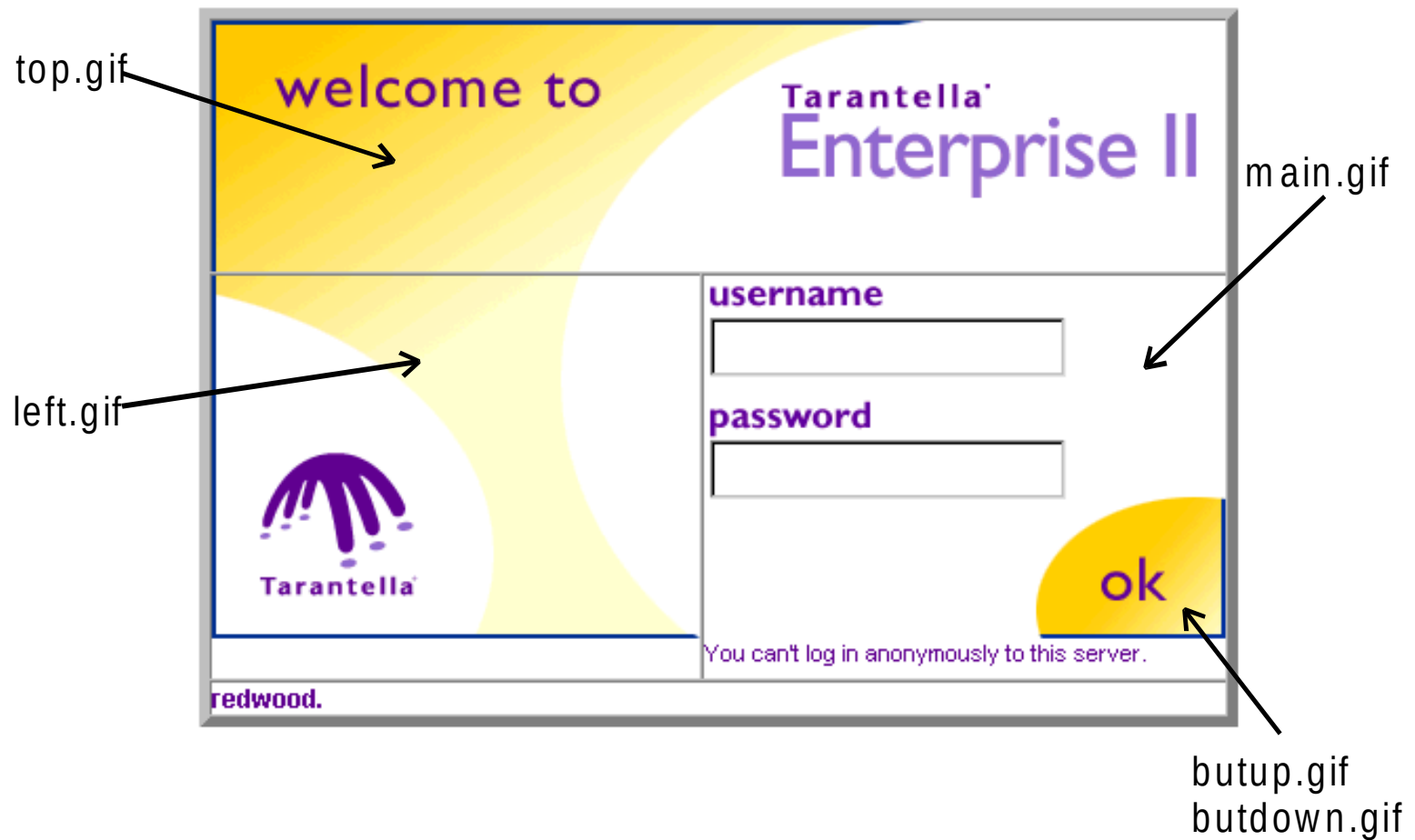
ok



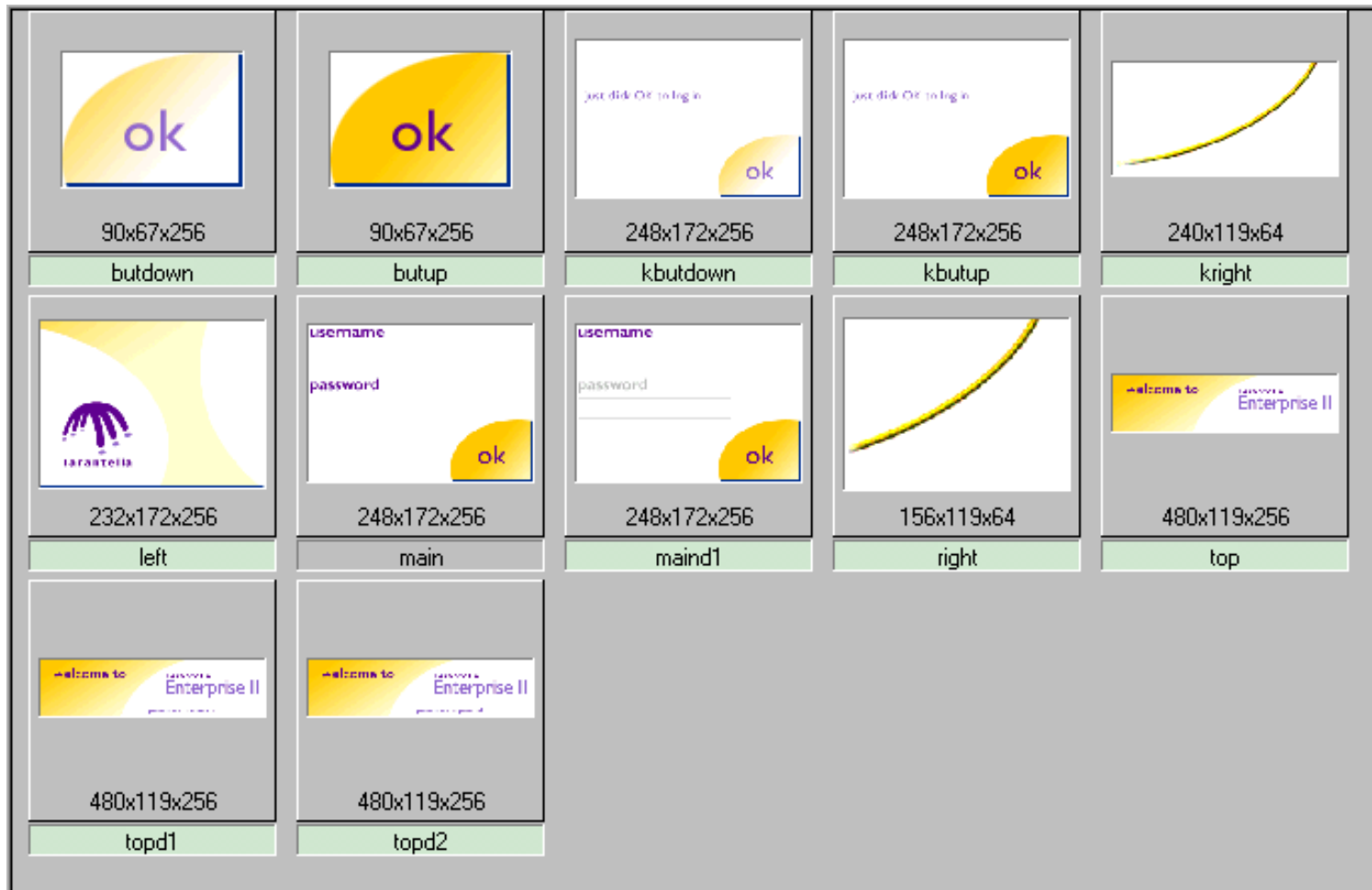
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Anatomy of the Tarantella Login Screen



Login Screen Graphics Files



The Tarantella Webtop

The screenshot shows the Tarantella webtop interface within a Microsoft Internet Explorer window. The browser's address bar displays `http://www.example.com/tarantella/index.html`. The interface is divided into two main sections: a purple sidebar on the left and a main content area on the right.

Left Sidebar (Launch Pad):

- Help & Logout (indicated by an arrow)
- Tarantella web site
- SCO web site
- Control Center
- Release Notes
- Admin Guide
- VT420 (redwood)
- SCO Console (redwood)
- xterm
- Print Status (indicated by an arrow)

Main Content Area:

- Tarantella[®] Enterprise II**
- Welcome to your webtop!**
- To use an application, or view a document, just click one of the links on the left.
- For more information, read [Using Your Webtop](#).
- Tarantella[®] logo at the bottom right.



The Tarantella "asad" Applet

```
<ttaapplet archive="asad" name="Tarantella Webtop" code="SmartIconHost" width="%  
%CALCWIDTH%" height="%%CALCHEIGHT%%">  
  
<!-- Don't touch these parameters: -->  
<param name="ObjectCount" value="%%OBJCOUNT%%">  
<param name="AsadPort" value="%%ASADPORT%%">  
  
<!-- Following parameters may be configured, but don't delete them: -->  
<param name="ObjectWidth" value="%%OBJWIDTH 127%%">  
<param name="ObjectHeight" value="%%OBJHEIGHT 34%%">  
  
<!-- Following parameters may be configured, or omitted: -->  
<param name="LayoutStyle" value="%%LAYOUTSTYLE vertical%%">  
<param name="ObjectGap" value="%%OBJGAP 10%%">  
<param name="TopMargin" value="%%TOPMARGIN 0%%">  
<param name="BottomMargin" value="%%BOTTOMMARGIN 0%%">  
<param name="LeftMargin" value="%%LEFTMARGIN 5%%">  
<param name="RightMargin" value="%%RIGHTMARGIN 0%%">  
<param name="IconToLabelGap" value="8">  
<param name="BorderWidth" value="1">  
<param name="IconTheme" value="standard">  
<param name="TargetFrame" value="DisplayFrame">  
<param name="ShowLabel" value="true">  
<param name="ShowIcon" value="true">
```



The Tarantella Logging Out Screen



The Tarantella Logged Out Screen

Tarantella[®] Enterprise II

Logged out

You successfully logged out, and your Tarantella session has ended.

If you want, you can close your web browser now or [log in](#) again.



The Example Company Login Screen

I need examples quick!
Who should I call?



**Example
Company**

username

password

Ok

redwood.



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The Tarantella 3270 Connectivity Pack

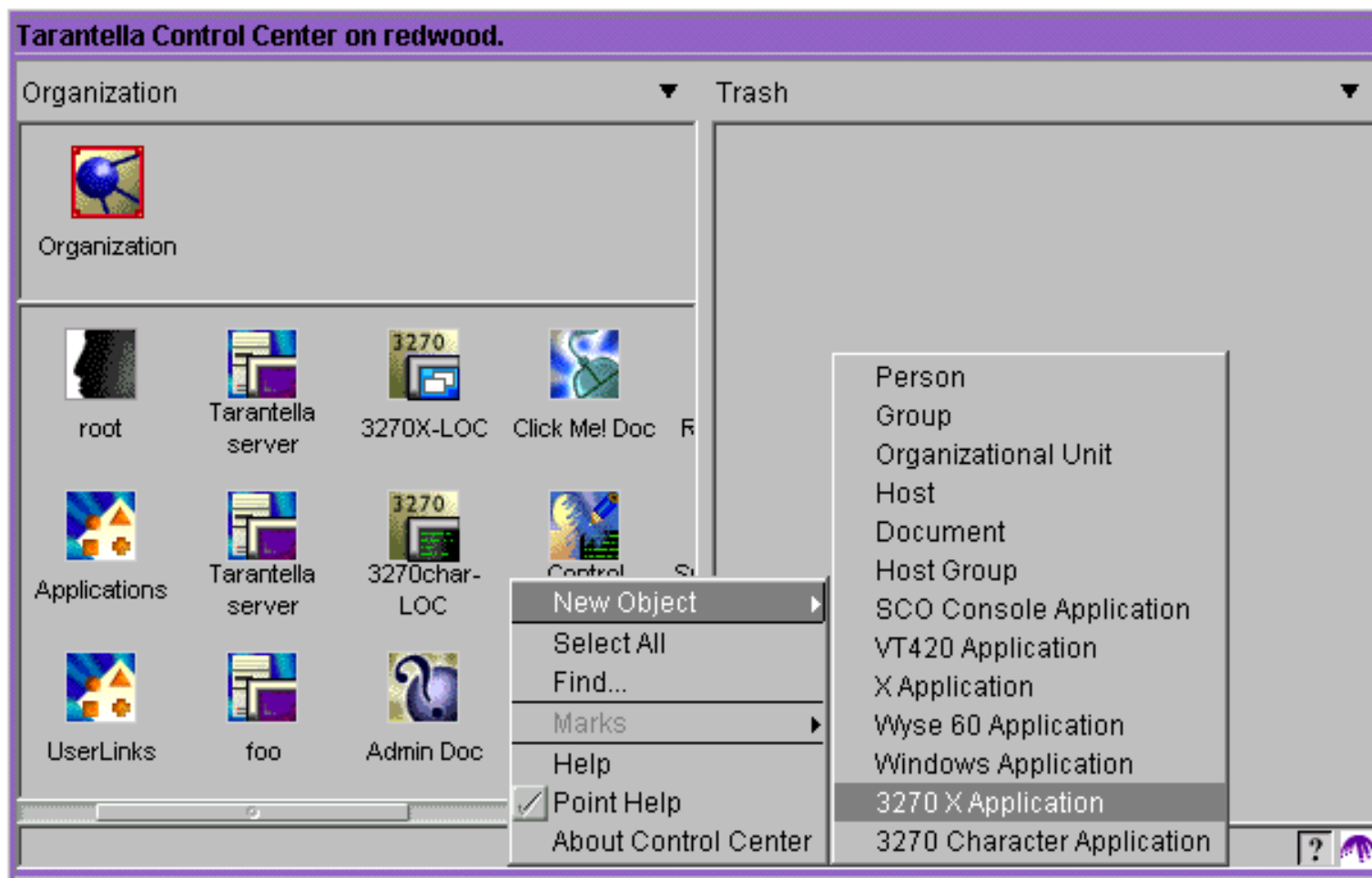
- Installing the Tarantella 3270 Connectivity Pack
- Configuring 3270 Applications



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Configuring 3270 Applications



Networking Basics and Tarantella

- Networking Basics
- Networking Utilities
- Debugging Methodologies



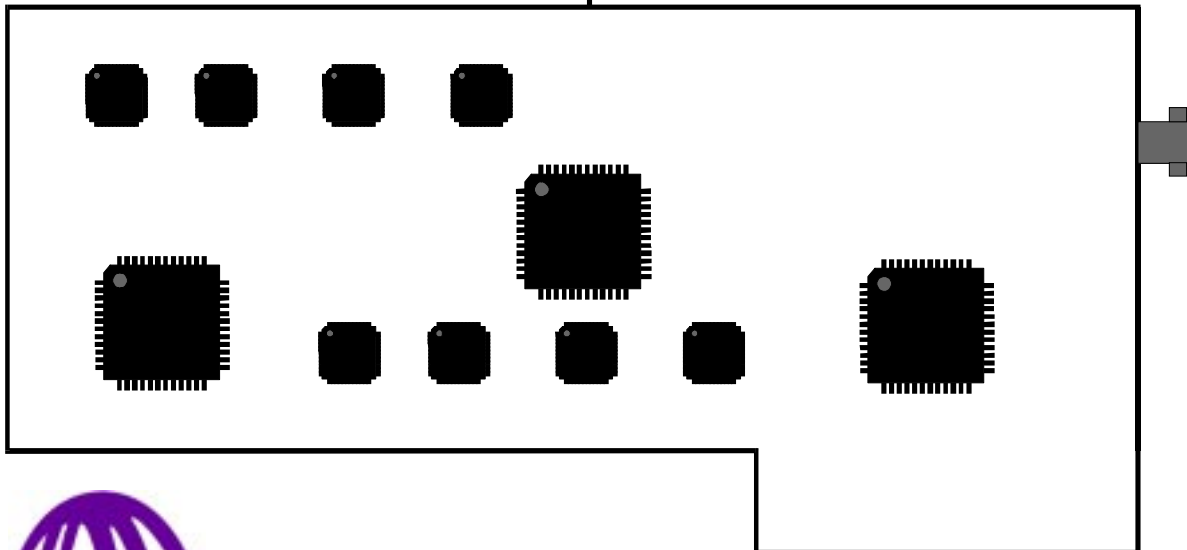
©The Santa Cruz Operation, Inc.



IP over Ethernet

IP

10.10.10.123



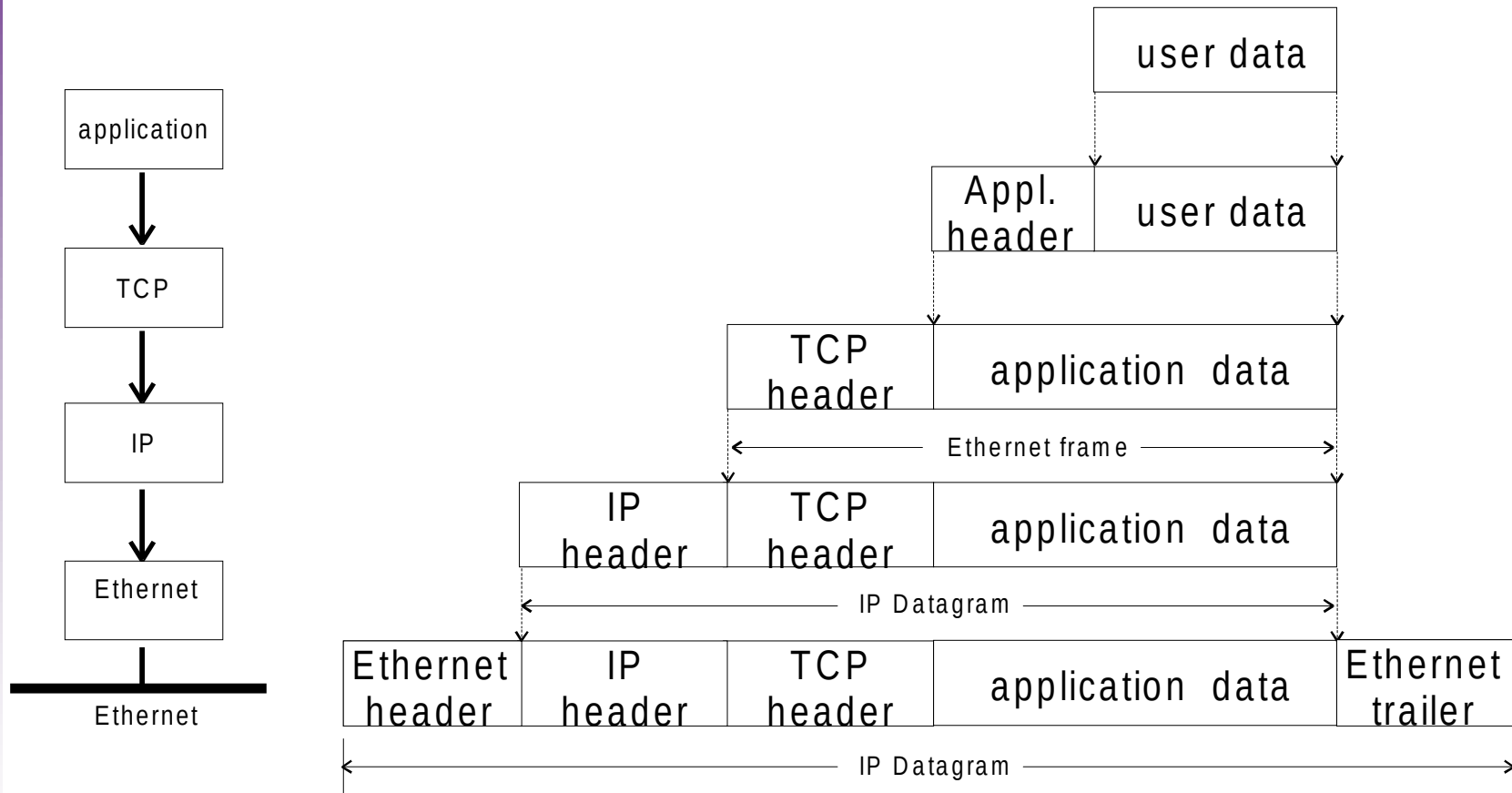
1F:34:32:44:7C:A1



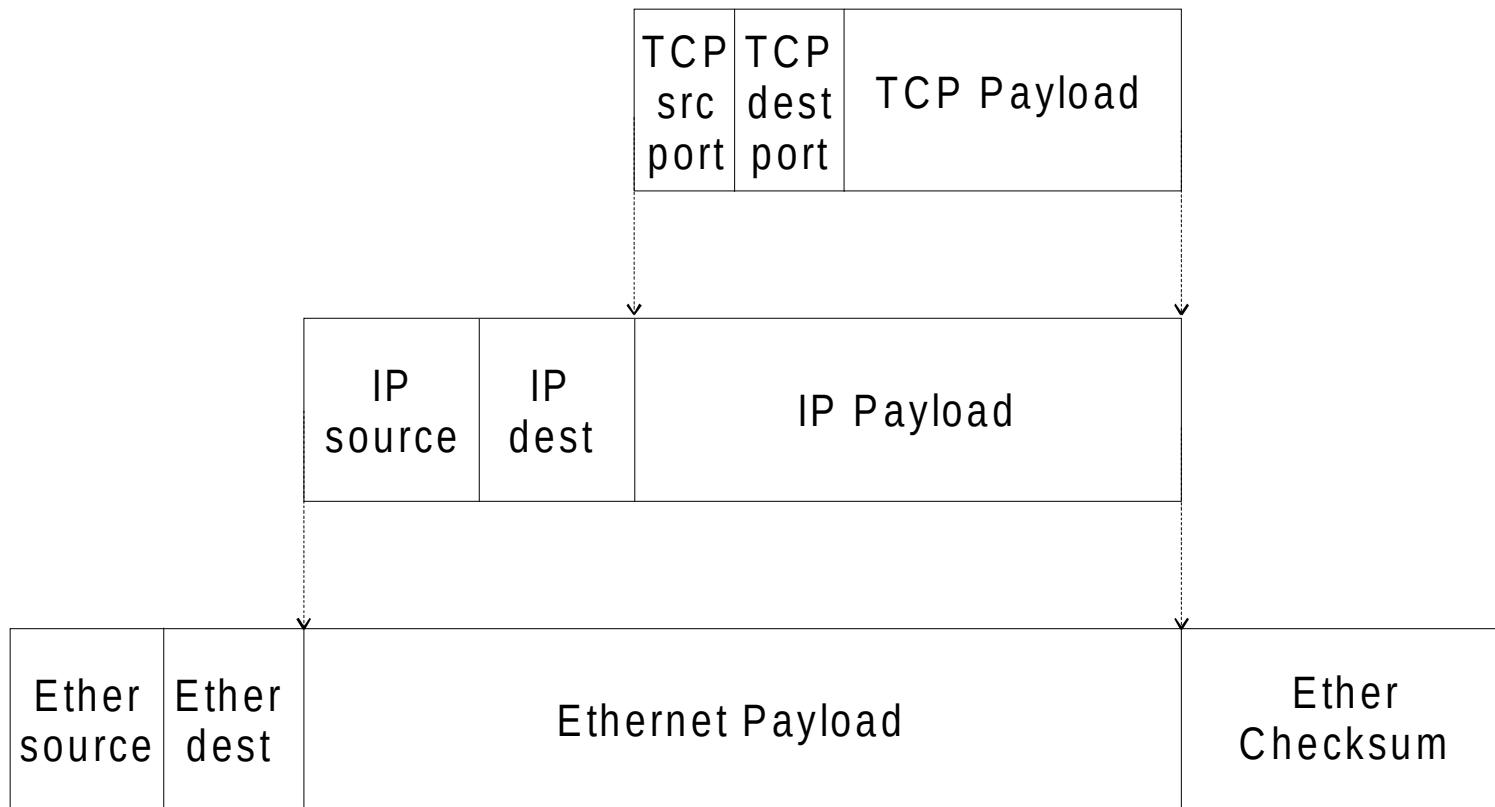
©The Santa Cruz Operation, Inc.



Encapsulation



Contents of TCP Segments, IP Datagrams, and Ethernet Frames



The ifconfig Command

```
# ifconfig net0 alias 10.10.10.2
# ifconfig -a
lo0: flags=4049<UP,LOOPBACK,RUNNING,MULTICAST> mtu 16384
    inet 127.0.0.1 netmask ffffffff
    inet/perf: rcv size: 4096; send size: 8192; full-size frames: 1
    inet/options: rfc1323
net0: flags=4043<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.10.10.1 netmask fffffff0 broadcast 10.10.10.255
    inet/perf: rcv size: 4096; send size: 8192; full-size frames: 1
    inet/options: rfc1323
    ether 00:00:b4:81:f7:b9
    (alias) inet 10.10.10.2 netmask fffffff0 broadcast 10.10.10.255
```



The ping Command

```
# ping venezia.uss.sco.com
venezia.uss.sco.com is alive
#
#
# ping -s venezia.uss.sco.co
PING venezia.uss.sco.com: 56 data bytes
64 bytes from venezia.uss.sco.com (10.10.10.59): icmp_seq=0. time=0. ms
64 bytes from venezia.uss.sco.com (10.10.10.59): icmp_seq=1. time=0. ms
64 bytes from venezia.uss.sco.com (10.10.10.59): icmp_seq=2. time=0. ms
64 bytes from venezia.uss.sco.com (10.10.10.59): icmp_seq=3. time=0. ms

----venezia.uss.sco.com PING Statistics----
4 packets transmitted, 4 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 0/0/0
```



The netstat Command

```
# netstat -a
Active Internet connections (including servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         (state)
tcp        0      0 venezia.uss.sco..ftp    firenze.uss.sco..1038   FIN_WAIT_2
tcp        0      2 venezia.uss.sco..telne  firenze.uss.sco..1037   ESTABLISHED
tcp        0      0 *.32782                 *.*                     LISTEN
tcp        0      0 *.printer               *.*                     LISTEN
tcp        0      0 *.listen                *.*                     LISTEN
tcp        0      0 *.dtspc                 *.*                     LISTEN
tcp        0      0 *.i2odialo              *.*                     LISTEN
tcp        0      0 *.chargen               *.*                     LISTEN
tcp        0      0 *.daytime               *.*                     LISTEN
tcp        0      0 *.discard               *.*                     LISTEN
tcp        0      0 *.echo                  *.*                     LISTEN
tcp        0      0 *.time                  *.*                     LISTEN
tcp        0      0 *.netstat               *.*                     LISTEN
tcp        0      0 *.systat                *.*                     LISTEN
tcp        0      0 *.finger                *.*                     LISTEN
tcp        0      0 *.imap-4                *.*                     LISTEN
tcp        0      0 *.pop-3                 *.*                     LISTEN
tcp        0      0 *.exec                  *.*                     LISTEN
tcp        0      0 *.login                 *.*                     LISTEN
```



The netstat Command

```
# netstat -r
Routing tables
Destination      Gateway           Flags      Refs      Use  Interface
default          xylan244.uss.sco.C UGS        0        111  net0
localhost        localhost         UH         5         77  lo0
10.10.10/24      venezia.uss.sco.co UC          0          0  net0
venezia.example. localhost         UGHS       4         18  lo0
224/8            venezia.uss.sco.co UGS        1          9  net0
```



The traceroute Command

```
# traceroute standards.ieee.org
traceroute to standards.ieee.org (199.172.136.45), 30 hops max, 80 byte packets
 1  abovenet.wams.com (207.126.116.142)  0 ms  0 ms  0 ms
 2  209.133.3.3 (209.133.3.3)  50 ms  50 ms  40 ms
 3  216.200.0.205 (216.200.0.205)  40 ms  40 ms  40 ms
 4  216.200.0.21 (216.200.0.21)  130 ms  100 ms  120 ms
 5  209.133.31.106 (209.133.31.106)  140 ms  130 ms  80 ms
 6  iad3.phl00.verio.net (129.250.3.106)  110 ms  120 ms  130 ms
 7  fa-0-0-0.a00.phlapa01.us.ra.verio.net (129.250.31.36)  90 ms  110 ms  90 ms
 8  d3-1-0-0.a00.prttnj01.us.ra.verio.net (130.94.40.102)  130 ms  120ms  130 ms
 9  d3-0-1-1.a01.jrcynj01.us.ra.verio.net (130.94.10.250)  140 ms  130 ms  90
10  fa-1-0-0.a00.jrcynj01.us.ra.verio.net (130.94.80.1)  140 ms  150ms  230 ms
11  130.94.83.2 (130.94.83.2)  110 ms  160 ms  110 ms
12  standards.ieee.org (199.172.136.45)  140 ms  120 ms  130ms
```



The arp Command

```
# arp -a  
bologna.example.COM (10.10.10.6) at 2:7:1:19:e3:5e (802.3)  
firenze.example.COM (10.10.10.54) at 0:e0:98:72:d6:21 (802.3)  
milano.example.COM (10.10.10.35) at 0:a0:c9:ec:68:f1 (802.3)
```



The nslookup Command

```
# nslookup
Default Server: ns1.example.COM
Address: 10.10.10.1

> venezia.example.com
Server: ns1.sco.COM
Address: 10.10.10.1

Name:    venezia.example.com
Address: 10.10.10.59
```



The nslookup Command

```
# nslookup
Default Server:  ns1.example.COM
Address:  10.10.10.1

> set type=any
> www.sco.com
Server:  ns1.example.COM
Address:  10.10.10.1

www.sco.com      internet address = 209.1.8.14
example.COM nameserver = ns2.example.COM
example.COM nameserver = ns1.example.COM
ns2.example.COM  internet address = 10.10.10.1
ns1.example.COM  internet address = 10.10.10.2
```



The ipconfig Command

```
C:\WINDOWS\Desktop> ipconfig /all  
Windows 98 IP Configuration
```

```
Host Name . . . . . : firenze.example.com  
DNS Servers . . . . . : 10.10.10.1  
                     10.10.10.2  
Node Type . . . . . : Broadcast  
NetBIOS Scope ID. . . . . :  
IP Routing Enabled. . . . . : No  
WINS Proxy Enabled. . . . . : No  
NetBIOS Resolution Uses DNS : Yes
```

```
0 Ethernet adapter :
```

```
Description . . . . . : ISA Ethernet Adapter.  
Physical Address. . . . . : 00-E0-98-72-D6-21  
DHCP Enabled. . . . . : No  
IP Address. . . . . : 10.10.10.3  
Subnet Mask . . . . . : 255.255.255.0  
Default Gateway . . . . . : 10.10.10.1  
Primary WINS Server . . . . . :  
Secondary WINS Server . . . . . :  
Lease Obtained. . . . . :  
Lease Expires . . . . . :
```



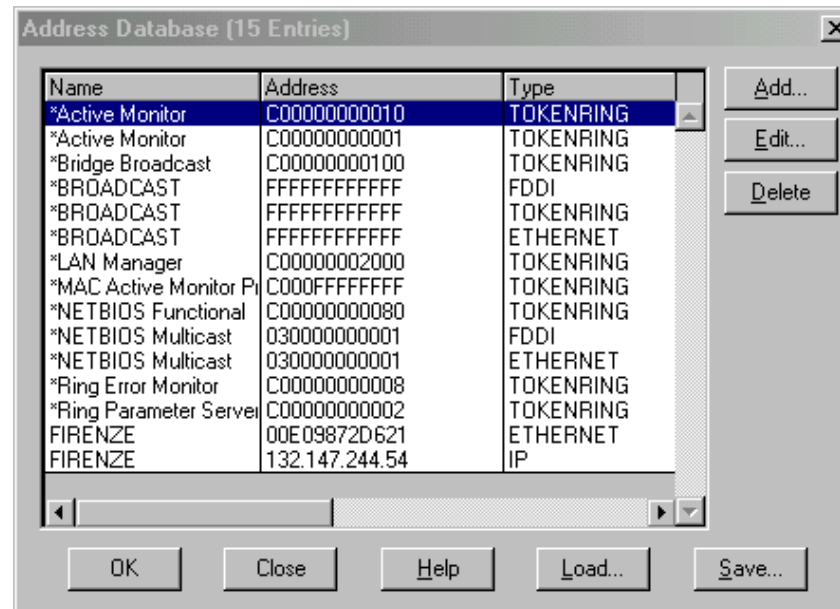
Telneting to an FTP Server

```
→ # telnet venezia 21
Trying 10.10.10.59
Connected to venezia.example.com.
Escape character is '^]'.
220 venezia.example.com FTP server (wu-2.4.2-academ-15) ready.
→ USER root
331 Password required for root.
→ PASS ClearText
230 User root logged in.
→ QUIT
221 Goodbye.
Connection closed by foreign host.
```

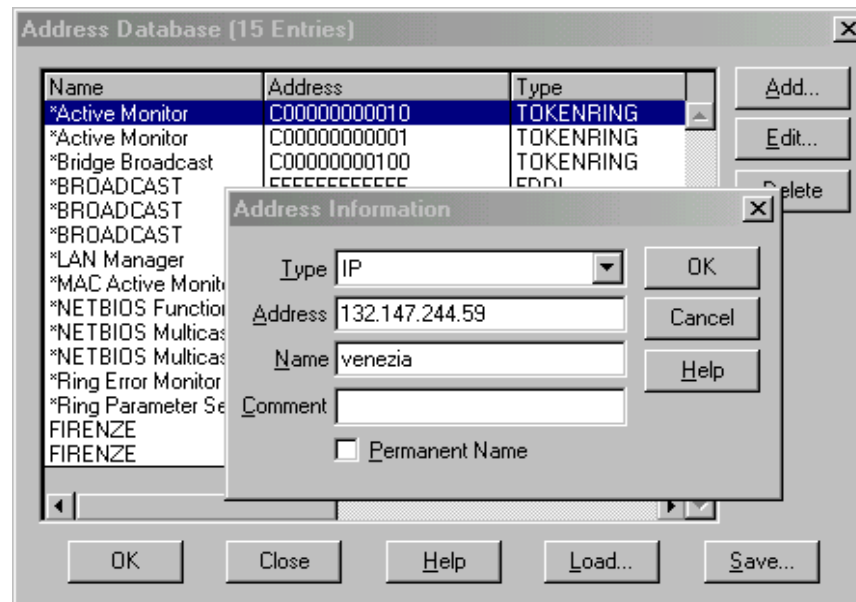
→ Commands typed



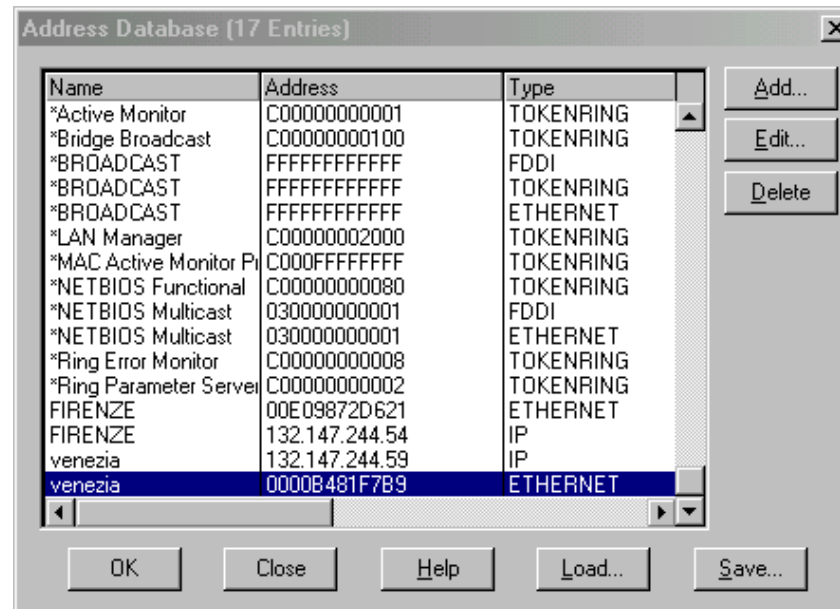
Adding Ethernet and IP Addresses



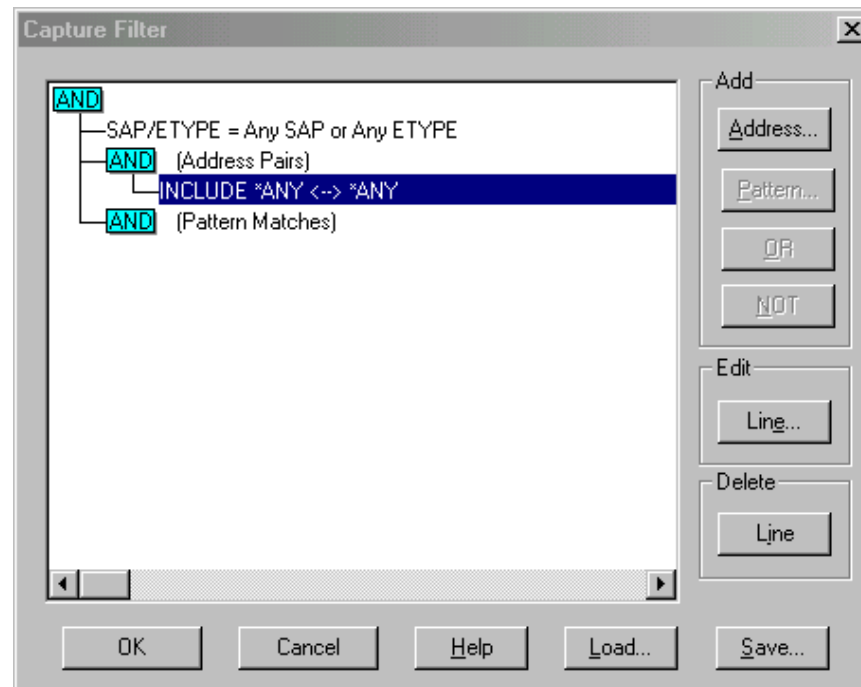
Adding Ethernet and IP Addresses



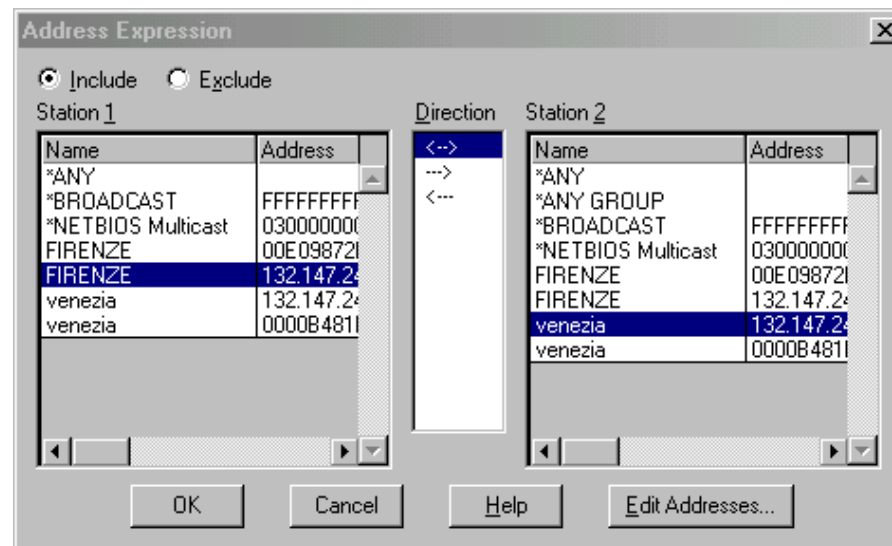
Adding Ethernet and IP Addresses



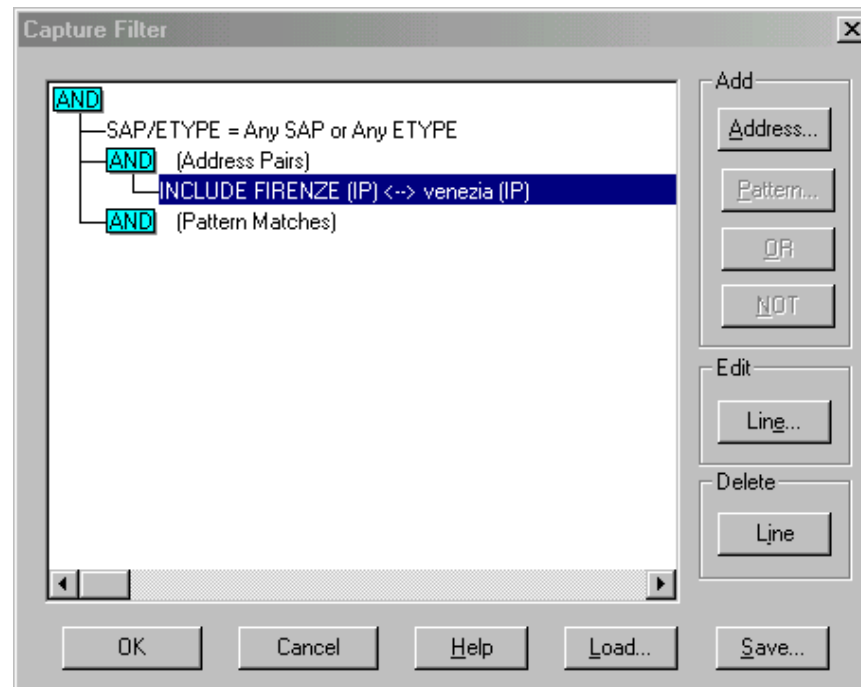
Filtering Capture Addresses



Filtering Capture Addresses



Filtering Capture Addresses



Generating Network Traffic with FTP

```
C:\WINDOWS\Desktop>ftp venezia.uss.sco.com
Connected to venezia.uss.sco.com.
220 venezia.uss.sco.com FTP server (wu-2.4.2-academ-15) ready.
User (132.147.244.59:(none)): root
331 Password required for root.
Password:
230 User root logged in.
ftp> dir /stand
220 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
total 17598
drwxrwxr-x   2 root    sys          288 Dec 21 17:49 .
drwxr-xr-x  48 root    sys        3072 Feb  9 10:16 ..
-r--r--r--   1 root    sys        1036 Apr  7 1998 bfs.blm
-rw-r--r--   1 root    sys         151 Dec 20 03:14 boot
-r--r--r--   1 root    sys        1211 Apr  7 1998 bootmsgs
-r--r--r--   1 root    sys        9980 Apr  7 1998 dcmp.blm
-r--r--r--   1 root    sys        1829 Mar  5 1999 hd.blm
-r--r--r--   1 root    sys        3486 Apr  7 1998 help.txt
-rw-r--r--   1 root    sys         620 Feb  9 09:59 license
-r--r--r--   1 root    sys       25359 Apr  7 1998 logo.img
-r--r--r--   1 root    sys        5608 Mar  5 1999 platform.blm
-rw-r--r--   1 root    sys       13450 Feb  9 09:59 resmgr
-rw-r--r--   1 root    root       13450 Feb  9 09:41 resmgr.sav
-r--r--r--   1 root    sys         891 Apr  7 1998 smallfs.blm
-r--r--r--   1 root    sys       10848 Mar  5 1999 stage3.blm
-rwxr--r--   1 root    root    2994836 Dec 21 17:49 unix
-rwxr--r--   1 root    sys    2933688 Dec 21 17:37 unix.good
-rwxr--r--   1 root    sys    2985916 Dec 21 17:46 unix.old
226 Transfer complete.
ftp: 1222 bytes received in 0.17Seconds 7.19Kbytes/sec.
ftp> bye
221 Goodbye.

C:\WINDOWS\Desktop>
```



Network Monitor Layout

Frame
panel

Details
panel

Hex dump
panel

The screenshot shows the Network Monitor application window titled "Network Monitor - [D:\NM\CAPTURES\ftp.cap (Summary)]". The interface includes a menu bar (File, Edit, Display, Tools, Options, Window, Help) and a toolbar with various icons. The main display is divided into three panels:

- Frame panel:** A table listing captured frames. Frame 8 is selected.
- Details panel:** Displays the protocol stack for the selected frame, including Ethernet II, IP, TCP, and FTP details.
- Hex dump panel:** Shows the raw data of the selected frame in hexadecimal and ASCII.

Frame	Time	Src MAC Addr	Dst MAC Addr	Protocol	Description
4	150.549	VENEZIA	FIRENZE	FTP	Resp. to Port 1056, '220 venezia.uss.sco.com FTP server (
6	155.172	FIRENZE	VENEZIA	FTP	Req. from Port 1056, 'USER root'
8	155.194	VENEZIA	FIRENZE	FTP	Resp. to Port 1056, '331 Password required for root.'
10	159.819	FIRENZE	VENEZIA	FTP	Req. from Port 1056, 'PASS ClearText'
12	159.830	VENEZIA	FIRENZE	FTP	Resp. to Port 1056, '230 User root logged in.'

Details panel content:

- FRAME: Base frame properties
- ETHERNET: ETYP = 0x0800 : Protocol = IP: DOD Internet Protocol
- IP: ID = 0xBC3D; Proto = TCP; Len: 73
- TCP: .AP..., len: 33, seq: 59878550-59878582, ack: 11343672, win: 4380, src: 21 (FTP) dst: 1056
- FTP: Resp. to Port 1056, '331 Password required for root.'

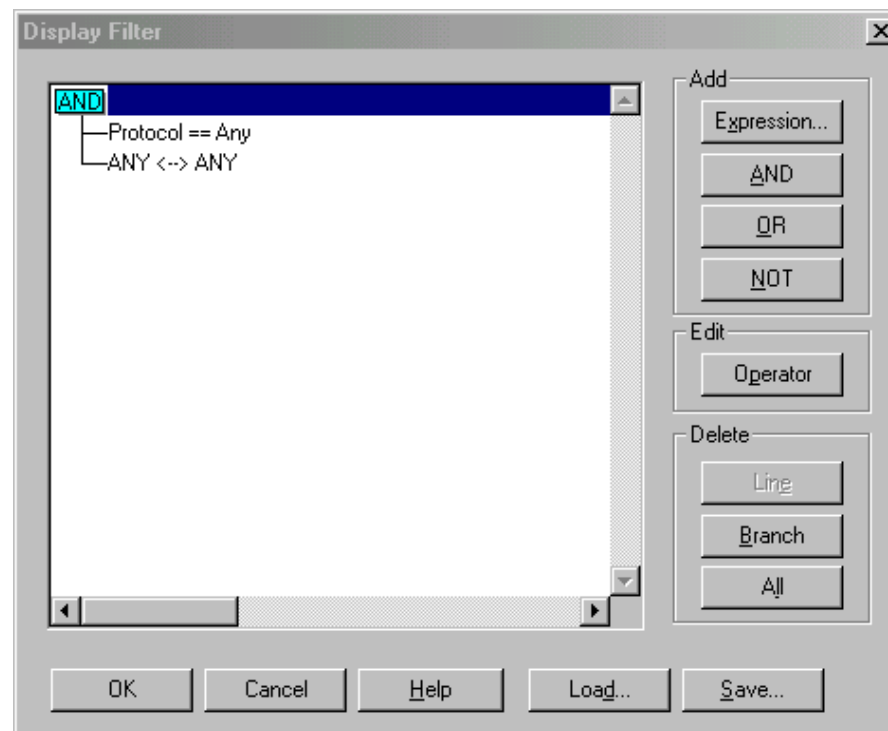
Hex dump panel content:

```
00000000 00 E0 98 72 D6 21 00 00 B4 81 F7 B9 08 00 45 10 .ayr+!..ü"!..E.
00000010 00 49 BC 3D 00 00 40 06 CC C8 84 93 F4 3B 84 93 .I+=..@.|+äô(;äô
00000020 F4 36 00 15 04 20 03 91 AC 96 00 AD 17 38 50 18 (6$. äwü..j.8P.
00000030 11 1C 0A 65 00 00 33 33 31 20 50 61 73 73 77 6F ...e..33l Passwo
00000040 72 64 20 72 65 71 75 69 72 65 64 20 66 6F 72 20 rd required for
00000050 72 6F 6F 74 2E 0D 0A root...
```

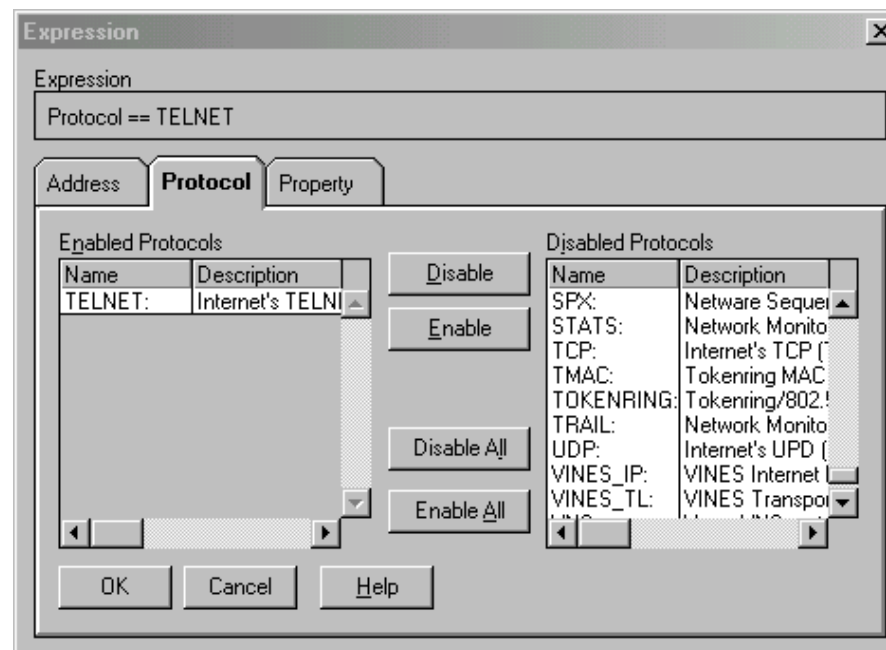
Footer: FTP Protocol Packet Summary | F#: 8/38 | Off: 54 (x36) | L: 33 (x21)



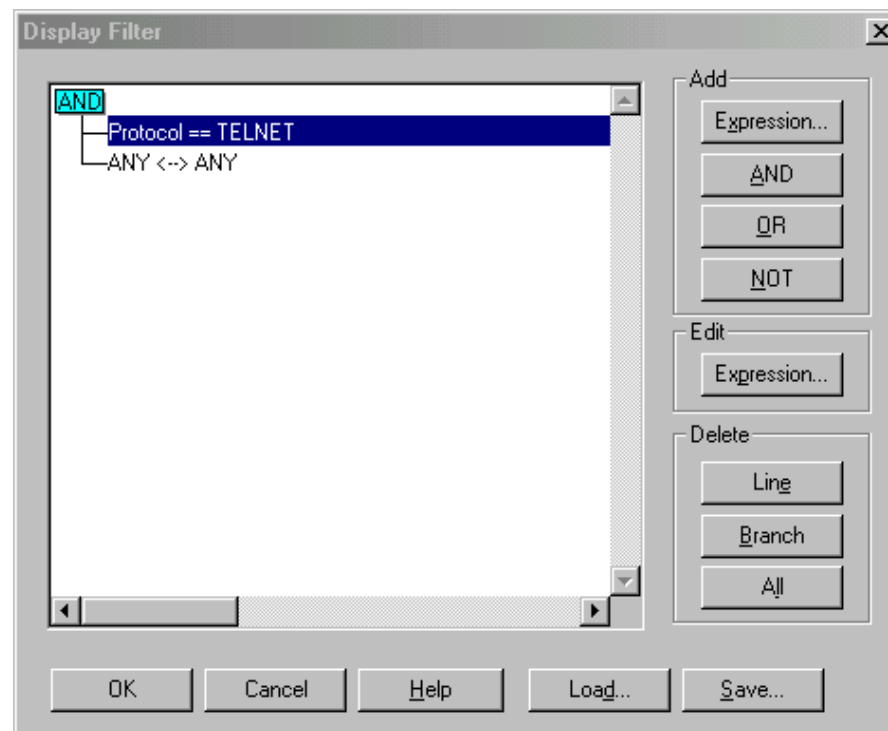
Filtering Frames Displayed Based on Protocol Type



Filtering Frames Displayed Based on Protocol Type



Filtering Frames Displayed Based on Protocol Type



The Application Data

```
+FRAME: Base frame properties
+ETHERNET: ETYPE = 0x0800 : Protocol = IP: DOD Internet Protocol
+IP: ID = 0x3C13; Proto = TCP; Len: 56
+TCP: .AP..., len: 16, seq: 11343672-11343687, ack: 59878583, win: 8663, src: 1056 dst: 21 (FTP)
-FTP: Req. from Port 1056, 'PASS ClearText'
  FTP: FTP Command = PASS
  FTP: FTP Data: Number of data bytes remaining = 12 (0x000C)
```



The TCP Segment

```
+FRAME: Base frame properties
+ETHERNET: ETYPE = 0x0800 : Protocol = IP:  DOD Internet Protocol
+IP: ID = 0x3C13; Proto = TCP; Len: 56
-TCP: .AP..., len: 16, seq: 11343672-11343687, ack: 59878583, win: 8663, src: 1056  dst: 21 (FTP)
  TCP: Source Port = 0x0420
  TCP: Destination Port = FTP [control]
  TCP: Sequence Number = 11343672 (0xAD1738)
  TCP: Acknowledgement Number = 59878583 (0x391ACB7)
  TCP: Data Offset = 20 (0x14)
  TCP: Reserved = 0 (0x0000)
-TCP: Flags = 0x18 : .AP...
  TCP: ..0..... = No urgent data
  TCP: ...1..... = Acknowledgement field significant
  TCP: ....1.... = Push function
  TCP: .....0.. = No Reset
  TCP: .....0. = No Synchronize
  TCP: .....0 = No Fin
  TCP: Window = 8663 (0x21D7)
  TCP: Checksum = 0x6456
  TCP: Urgent Pointer = 0 (0x0)
  TCP: Data: Number of data bytes remaining = 16 (0x0010)
+FTP: Req. from Port 1056, 'PASS ClearText'
```



The IP Datagram

```
+FRAME: Base frame properties
+ETHERNET: ETYPE = 0x0800 : Protocol = IP:  DOD Internet Protocol
-IP: ID = 0x3C13; Proto = TCP; Len: 56
  IP: Version = 4 (0x4)
  IP: Header Length = 20 (0x14)
+IP: Service Type = 0 (0x0)
  IP: Total Length = 56 (0x38)
  IP: Identification = 15379 (0x3C13)
+IP: Flags Summary = 2 (0x2)
  IP: Fragment Offset = 0 (0x0) bytes
  IP: Time to Live = 128 (0x80)
  IP: Protocol = TCP - Transmission Control
  IP: Checksum = 0xCD13
  IP: Source Address = 132.147.244.54
  IP: Destination Address = 132.147.244.59
  IP: Data: Number of data bytes remaining = 36 (0x0024)
+TCP: .AP..., len: 16, seq: 11343672-11343687, ack: 59878583, win: 8663, src: 1056 dst: 21 (FTP)
+FTP: Req. from Port 1056, 'PASS ClearText'
```



The Ethernet Frame

```
+FRAME: Base frame properties
-ETHERNET: ETYPE = 0x0800 : Protocol = IP:  DOD Internet Protocol
+ETHERNET: Destination address : 0000B481F7B9
+ETHERNET: Source address : 00E09872D621
  ETHERNET: Frame Length : 70 (0x0046)
  ETHERNET: Ethernet Type : 0x0800 (IP:  DOD Internet Protocol)
  ETHERNET: Ethernet Data: Number of data bytes remaining = 56 (0x0038)
+IP: ID = 0x3C13; Proto = TCP; Len: 56
+TCP: .AP..., len: 16, seq: 11343672-11343687, ack: 59878583, win: 8663, src: 1056 dst: 21 (FTP)
+FTP: Req. from Port 1056, 'PASS ClearText'
```

