



Tarantella[®] Express[™] Administration

Instructor Guide

Course Release: 1.0

For Software: Tarantella Express

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1

Introduction to Tarantella Express

Instructor Guide

Instructor Guide

Lesson 1

Introduction to Tarantella Express

Introduction

This course is designed for individuals who need to perform routine Tarantella administration tasks on a daily basis. The target audience includes support technicians, developers, engineers, and other technical users who require the ability to perform standard administration tasks.

Objectives

By the end of this lesson, you will be able to:

- Understand the format of this course
- Log into and out of Tarantella
- Use the Tarantella webtop
- Utilize Tarantella help resources

AV 1-1

Instructor Guide

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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SCO

Topics

In order to meet these objectives, this lesson discusses:

- Understanding the format of this course — Discusses the topics presented in this course and how the exercises and labs are structured.
- Logging into Tarantella — Discusses how to log into Tarantella as a user.
- Using the webtop — Discusses how to launch applications under Tarantella.
- Logging out of Tarantella — Discusses how to log out of Tarantella.
- Locating Tarantella Help — Discusses the various places to find help in Tarantella.



AV 1-1: Introduction to Tarantella

The first slide describes the overall topics covered in this lesson.

Equipment

The instructor and each student needs the following equipment:

- 1 industry standard Pentium CPU computer running SCO® UnixWare® 7
 - 2GB hard disk (minimum)
 - 64MB RAM (minimum, 96MB or greater recommended)
 - 1 network card
 - 1 (or more) IP address(es)
 - 1 (or more) DNS resolvable name(s)
- 1 industry standard Pentium CPU running Microsoft Windows 95 or 98
 - 2GB hard disk (minimum)
 - 64MB RAM (minimum)
 - 1 network card
 - 1 (or more) IP address(es)
 - 1 (or more) DNS resolvable name(s)
 - Internet Explorer and/or Netscape® Communicator® installed and configured (See <http://tarantella.sco.com/sysreqs> for more info).

The classroom will need to be equipped with the following:

- A connection to the Internet with adequate bandwidth to support the number of students in attendance
- All network infrastructure and equipment (hubs, switches, cables) necessary to inter-connect all of these machines to each other and to the Internet
- 1 (or more) DNS server(s) providing name service. This server must contain all the IP addresses and names used by the student and instructor machines.
- 1 (or more) Windows NT Terminal Server Edition or Windows 2000 Advanced Server system(s)
- 1 printer (minimum) made accessible to the Windows machines by one (or more) of the following methods:
 - A Windows printer share
 - HP Jet Direct
- 1 VGA projector
- White board with markers

1.1 Introduction to Tarantella Express Administration

The ***Tarantella Express Administration*** course covers a range of topics selected to assist technical users in all aspects of administering Tarantella Express servers. Topics include discussions on installing Tarantella and its add-on packages, customizing Tarantella, and understanding the technologies that form the foundation upon which Tarantella runs.

1.1.1 Course goal and purpose

At the conclusion of this course, students should be able to accomplish tasks such as using Tarantella as an end-user, administering Tarantella servers, installing the various Tarantella components, and customizing the Tarantella login screen and webtop. By the end of the course, students will be able to:

- Login and logout of Tarantella
- Install Tarantella, the Tarantella Security Pack and the Windows Connectivity Pack
- Configure applications, documents, users, organization units, and the Tarantella organization
- Access Tarantella via the Native Client
- Configure printing under Tarantella
- Configure application server farms
- Secure Tarantella servers using the Secure Sockets Layer (SSL) capabilities provided by the Tarantella Security Pack
- Customize the Tarantella login screen
- Customize the Tarantella webtop
- Customize the icons used by Tarantella
- Provide access to Windows applications with the Windows Connectivity Pack

1.1.2 Target audience

This is an intermediate level course, aimed at system administrators, support technicians, developers, and engineers. The course pre-requisites include a basic understanding of networking and the X Windows system.

1.1.3 Example Company

Throughout the lessons, exercises, and labs which follow, we will refer to a hypothetical company called Example Company, Inc. In addition, we will refer to the domain *example.com* and machines within that domain. This domain is a registered domain name, however it is not used by an actual organization. Rather, *example.com* is reserved for situations such as those posed by this class where a sample domain name is needed.

Course schedule

This course takes four days to complete. A suggested lesson duration is specified at the beginning of each lesson in this ***Instructor Guide***.

The labs included in the course must be completed in order to meet the course objectives.

Suggestions for practice exercises are also included throughout the course. Ample time has been allotted to each lesson to allow for the completion of these exercises.

Training materials

These training materials are used in this course:

- ***Instructor Guide*** and transparency masters
- ***Student Guide***
- Courseware CD-ROM

Software

This class uses the following software:

- Tarantella Express
- UnixWare 7
- Windows 95 or Windows 98
- Windows Terminal Server Edition or Windows 2000

The *Instructor Guide*

The ***Instructor Guide (IG)*** is organized as follows: Instructor notes are intermingled with text in the ***Student Guide (SG)*** to allow the instructor to easily refer to section content. Page numbers in the ***IG*** do not correspond to those in the ***SG***, however the heading numbers do.

Cross references to other sections within the course materials are included within the text. These cross references generally include the section number or AV number, the section name, and page number. The page number will almost always be different in the ***SG*** than the ***IG***; however, the other components will be the same.

The ***IG*** also contains notes which are instructional aids, including:

AV 1-2: Slide Title

These notes explain the instructional objective of every transparency. The AV number cross references to the number that appears above every slide in the workbook.

GuruNotes

This is extra information not directly presented in the ***SG*** and is intended for more advanced students.

Lesson plan

Each lesson follows a similar approach, or methodology, in the delivery of instruction:

- The suggested lesson duration and instructor preparation notes are provided at the beginning of each lesson when applicable.
- The lesson begins with an overview transparency of the major topics and a list of the lesson objectives.
- The lesson continues with the presentation of lesson topics and the demonstration of lesson tasks.
- Exercises, which allow the students to practice discrete tasks, appear throughout the presentation.
- References appear where appropriate.
- The lesson content concludes with a summary. Use this to reinforce the topics and tasks covered. You should also refer back to the objectives that were presented at the beginning of the lesson.
- Following the content of most lessons are summary exercises, which consist of review questions and labs. The review questions allow the instructor to determine how well the students understood the content, and the labs allow students to apply the material that they learned.

Using the root account in the classroom

When teaching *Tarantella Express Administration*, the instructor will refer to the use of the **root** account. The power of the **root** account in a UNIX system makes it both important and dangerous in the classroom; allowing students to use the **root** account risks damaging the system.

Why should students use root?

- They will be system administrators, and should learn to use **root** in the classroom before they use it on the job.
- They paid for the course, and often feel **root** privileges are part of what they paid for.
- Many procedures central to system administration are best learned with a hands-on approach.
- Many system administration students have already been system administrators, and expect to use **root**.

Why shouldn't students use root?

- Pranks and tampering can affect the classroom experience.
- Students should be discouraged from using **root** except when absolutely necessary
- Reinstalling a corrupted system wastes class time.
- Some instructors believe that **root** procedures and use can be taught just as well using the LCD display.

What to say to students

- Explain the above concerns.
- Explain your approach, along with its pros and cons.
- Make clear to students their responsibilities if they use the **root** account.

Classroom setup

Install the necessary software, including the operating system and the course software on all the machines.

- Configure a DNS master server on the instructor machine
- Install Tarantella®
- Configure anonymous ftp on the instructor machine
- Enable the web server
- To install the course software, follow these steps:

Step 1. Login as **root**.

Step 2. Insert the CD-ROM into the drive.

Step 3. Mount the CD-ROM:

```
# mount -F cdfs -r /dev/cdrom/cdrom1 /mnt
```

Step 4. Execute the setup program:

```
# sh /mnt/setup
```

Step 5. Unmount the CD-ROM.

```
# umount /mnt
```

- Configure classroom equipment, your own display, and the LCD.
- Problems have been encountered when Microsoft Outlook or Microsoft Outlook Express are running on the Windows clients. Remove these applications if necessary.

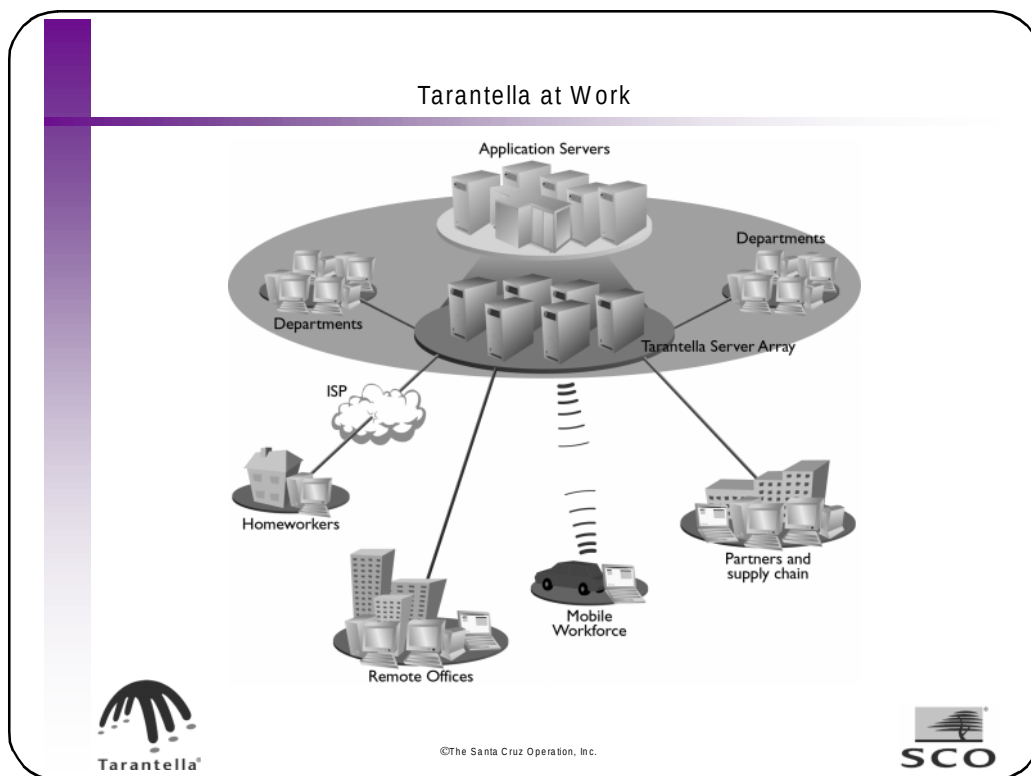
Lesson preparation

- Read the pre-lesson preparation prior to each lesson. Complete any tasks listed in the preparation.
- Read the lesson thoroughly before teaching, and add any additional notes or exercises.
- Read through the appropriate sections of the SCO documentation in support of the lesson topics.

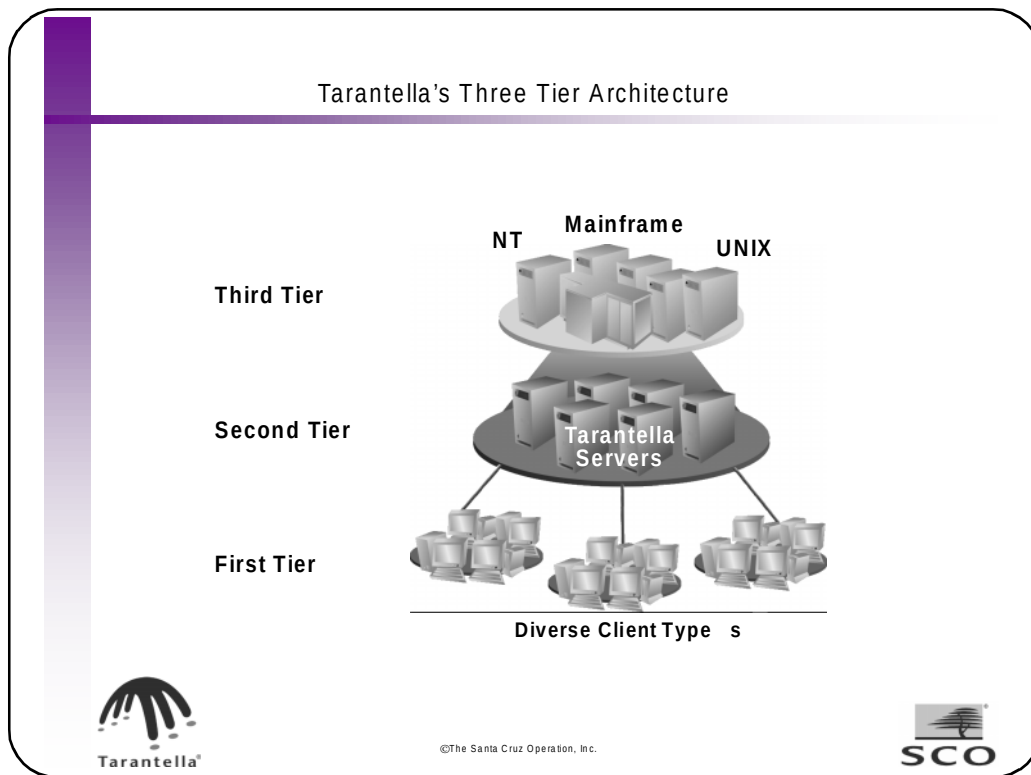
Crash course on what's new in Tarantella Express:

- Allows up to 45 concurrent users
- No Tarantella arrays (2nd tier servers)
- Allows up to 4 application servers (3rd tier servers)
- Installs and configures Apache as part of the Tarantella installation
- *Includes* the Windows Connectivity Pack
- Platform Wizards (aka. PIP—Platform Identity Pack) — Creates Tarantella objects related to the platform on which Tarantella is installed. For instance, the OpenServer PIP creates objects for the **scoadmin** utilities.
- Application Wizards (aka. SIP—Software Installation Pack) — Creates Tarantella objects related to a particular piece of software installed. For instance, the Microsoft SIP creates objects for Word, Excel, PowerPoint, etc.

AV 1-2



AV 1-3



1.2 Introduction to Tarantella Express

In this section, we describe what Tarantella[®] Express[™] is, what it does, how it does it, and what it can do for you. In later lessons, we'll look at Tarantella's capabilities in far greater detail.

AV 1-2: Tarantella at Work

Use this slide to illustrate what Tarantella does.

AV 1-3: Tarantella's Three Tier Architecture

Use this slide to illustrate Tarantella's three tier architecture.

1.2.1 What is Tarantella?

Tarantella instantly web-enables existing Unix and Windows applications. It does this without the need for rewriting *any* application code. Furthermore, Tarantella does not require additional software to be installed on clients or application servers.

To accomplish this, Tarantella utilizes a three-tier model in which the Tarantella server resides on the second tier. From this second tier, administrators can centrally control access to applications across multiple sites.

All of the Tarantella software is installed on the second tier. This means that clients and application servers are left unmodified. Tarantella simply drops into your existing network infrastructure.

Since Tarantella Express runs on a diverse range of clients, you are not required to replace or upgrade your existing clients with new devices.

1.2.2 Benefits of using Tarantella Express

Non-invasive	Tarantella is a non-invasive solution. No modifications are required on the clients or application servers.
Access	Tarantella provides diverse clients with access to applications running on Unix and Windows. Furthermore Tarantella delivers these applications across everything from a LAN to a dial-up modem connection over Point-to-Point Protocol (PPP).
Resumable Sessions	Tarantella users enjoy the benefit of being able to suspend their work. Rather than exit from all their applications at the end of the day, drive home, dial up the office, and restart all the applications to work from home, users simply log back into Tarantella from home and Tarantella resumes their applications automatically.
Customizable	Tarantella allows administrators to easily customize the appearance of Tarantella and the appearance of the applications launched within Tarantella.

Performance	SCO's Adaptive Internet Protocol (AIP) enables Tarantella to dynamically adjust itself to the performance of the client and the network connection.
Scalability	Tarantella Express provides excellent scalability by allowing administrators to implement application server farms. Application farms allow Tarantella to launch an application from any of the servers in the application farm.
Security	With the installation of the optional Tarantella Security Pack (TSP), Tarantella encrypts all Tarantella traffic on the network using Secure Sockets Layer (SSL).

- Without the TSP installed, Tarantella passwords are obfuscated (but not encrypted).

1.2.3 Features new to Tarantella Express

Tarantella Express adds several features not found in Tarantella Enterprise II. Tarantella Express:

- Automatically installs and configures the Apache web server
- Includes the Windows Connectivity Pack
- Platform Wizards install application objects specific to the platform on which Tarantella is installed (**scoadmin** icons for Tarantella Express[®] on SCO OpenServer[®])
- Application Wizards install application objects specific to a particular application installed on the Tarantella server (Microsoft[®] Word[®] and PowerPoint[®] icons for the Microsoft Application Wizard)

1.2.4 Limits of Tarantella Express

Tarantella Express has been designed to suit the needs of small to medium sized businesses. Tarantella Express:

- Imposes a limit of 45 concurrent Tarantella users
- Disallows Tarantella arrays
- Allows up to 4 application servers

If you need to exceed these limitations, upgrade to Tarantella Enterprise II. This upgrade can be performed in-place.

AV 1-4

The Tarantella Express Login Screen



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1.2.5 Logging into Tarantella Express

AV 1-4: Logging into Tarantella Express

Use this slide to illustrate logging into Tarantella Express

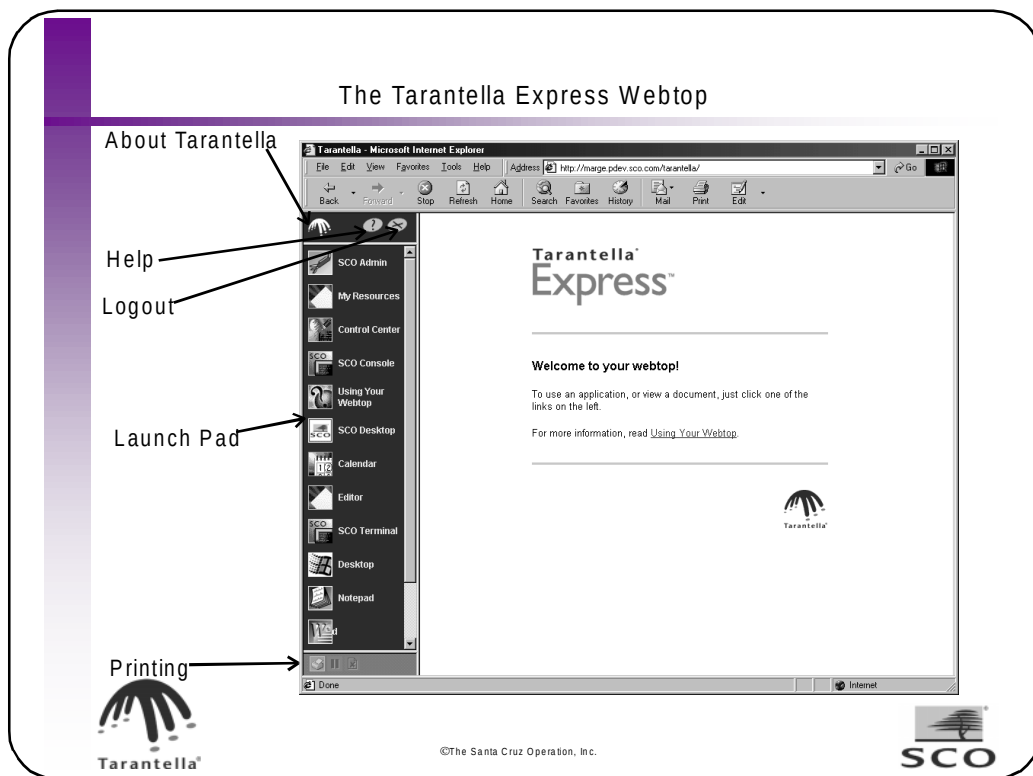
To log into Tarantella:

- Step 1. Start a web browser.
- Step 2. Enter the URL **http://server/tarantella**, where *server* is the name of the machine running Tarantella.
- Step 3. Enter your Tarantella user name.
- Step 4. Enter your password.
- Step 5. Click on the **Ok** button.

Exercise: Logging into Tarantella Express

Log into Tarantella using the server name, user name, and password supplied by your instructor.

AV 1-5



1.2.6 The Tarantella Express webtop

AV 1-5: The Tarantella Express Webtop

Use this slide to point out the various aspects of the webtop. If presenting the Tarantella Express version of this curriculum, point out the icons created by the PIP and SIP (**scoadmin** and Word, respectively).

The webtop is used to:

- Launch applications

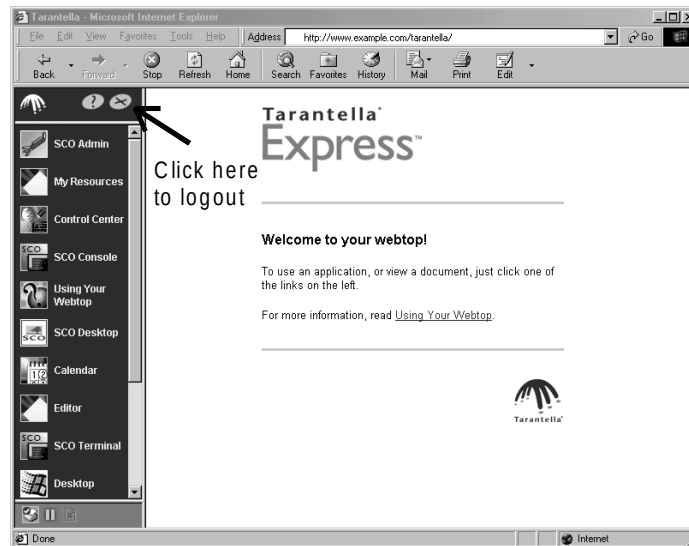
Demonstrate launching an application

- View documents
- Control printers
- Read on-line help

To perform any of these tasks, click on the applicable icon on the webtop.

AV 1-6

Logging out of Tarantella Express



Instructor Guide

1.2.6.1 Logging out of Tarantella Express

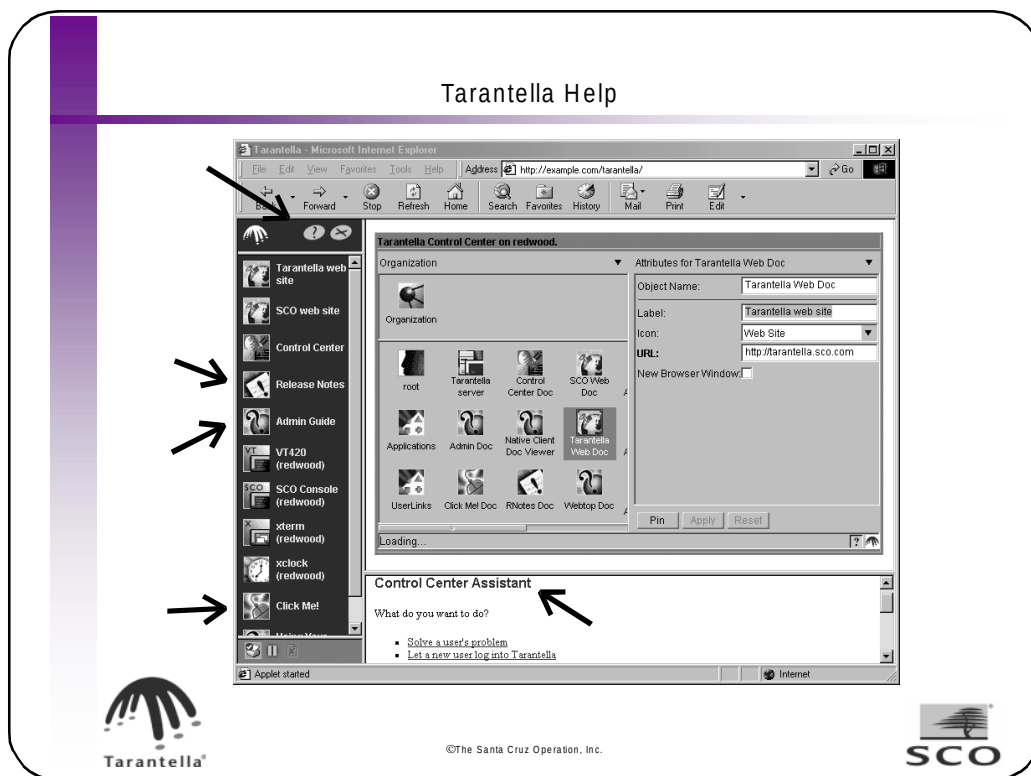
AV 1-6: Logging out of Tarantella Express

Use this slide to illustrate logging out of Tarantella Express

To log out of Tarantella, click on the “X” icon on the webtop.

NOTE: Be sure to click on the “X” icon *on the webtop*. Clicking on the “X” in the upper right corner of the browser’s window will close the browser without logging out of Tarantella. Doing this can lead to unintentionally suspended Tarantella sessions.

AV 1-7



1.3 Tarantella Documentation



AV 1-7: Tarantella Help

Use this slide to illustrate the various places where you get help in Tarantella.

References to Tarantella documentation are made throughout the ***Tarantella Express Administration*** course. This documentation is located on the Tarantella webtop in five areas:

Click Me!	A basic introduction to using Tarantella for end-users.
The “?” icon	Provides a more detailed introduction to Tarantella. Explains using and troubleshooting the webtop in “ <i>Getting Help on using the webtop</i> ”.
Release Notes	Provides late-breaking news about each Tarantella related product installed.
Admin Guide	Includes “How to” articles, technical reference pages, extensive customization information, and more.
Control Center Assistant	An on-line wizard that steps administrators through Tarantella administration tasks.

The Release Notes, Admin Guide, and Control Center Assistant are ordinarily available to Tarantella administrators only.

1.4 On-line References

In addition to the wealth of information provided on-line in Tarantella, you will want to use the following on-line references on the Internet.

Emphasize that the students are going to need to use these resources during the class.

1.4.1 Web sites

http://tarantella.sco.com/info/faq.html	Frequently Asked Questions about Tarantella Enterprise II and Tarantella Express.
http://tarantella.sco.com/knowhow	Contains searchable copies of documentation for all released versions of Tarantella.
http://tarantella.sco.com/tsz	The Tarantella Solution Zone contains hundreds of examples for customizing Tarantella.

The preceding URL will prompt users to register with the TSZ. Once the user has registered, they will be emailed this URL: **http://tarantella.sco.com/tsz/html/en_US**. This is the URL they should use from then on.

http://www.whatis.com	Offers definitions and explanations of computing terms.
http://www.ntfaq.com	Provides information on all aspects of using and administering Windows NT and Windows Terminal Server Edition.
http://www.counterpane.com	Contains security-related articles.
http://www.google.com	A search engine.
http://www.altavista.com	Another search engine.
http://www.ask.com	Another search engine.

1.4.2 News groups

news://pubnews.sco.com/sco.public.tarantella A news group dedicated to discussions on Tarantella products.

1.5 Typographical Conventions

This publication presents commands, filenames, keystrokes, and other special elements as shown here:

lp	Commands, device drivers, programs, and utilities (names, icons, or windows)
<i>/new/client.list</i>	Files, directories, desktops (names, icons, or windows), system, network, and printer names
root	User names
<i>arg</i> or <i>arg</i>	Placeholders (replace with appropriate name or value)
[<i>arg</i>]	Surrounds an <i>option</i> or <i>cmdarg</i> that is not mandatory
<i>arg</i> ...	Indicates multiple occurrences of the <i>option</i> or <i>cmdarg</i>
\$	Command-line prompt for commands executable from the Bourne shell by any user
#	Command-line prompt for commands only executable by the root user from the root account
	Keyboard keys
 	Press  and  keys simultaneously
  	Press all three keys,  ,  , and  , simultaneously
 d	Press  key. With  still depressed, press  .
 0240	Press  key. With  still depressed, press and release in sequence  ,  ,  , and  .
 Q + i	Press  key. With  still depressed, press  . Release both keys and press  .
 Q + I	Press  key. With  still depressed, press  . Release both keys and press   .Exit program?System output (prompts, messages)
tar tv	User input, such as on a command line

“Description”	Field names or column headings (on screen or in database)
Cancel	Button names
Edit	Menu names
Copy	Menu items
File ⇨ Find ⇨ Text	Sequences of menus and menu items
open	Library routines, system calls, kernel functions, C keywords
<code>\$HOME</code>	Environment or shell variables
<code>SIGHUP</code>	Named constants, signals, and kernel parameters
“adm3a”	Data values
<i>employees</i>	Database names and tables
buf	C program structures
<code>b_b.errno</code>	Structure members

1.6 Lesson Summary

This lesson described the basics of Tarantella: how to log in, how to launch applications, how to logout, and how to find help. In the lessons which follow, we delve deeper into Tarantella: how it works and how to configure it.

1.7 Review questions

1. What benefits does Tarantella provide?

Tarantella is non-invasive and customizable. Tarantella provides access to diverse clients and to Unix, Windows, and mainframe applications. Tarantella provides resumable session. The AIP protocol enables Tarantella to dynamically adjust to fit the current bandwidth. Tarantella provides secure communications.

2. How do you log into Tarantella?

You log into Tarantella by typing *http://server/tarantella* in a web browser, where *server* is the name of the Tarantella server.

3. What does the Tarantella webtop enable users to do?

The Tarantella webtop enables users to start applications, view documents, control printers, and read on-line help.

4. How do you log out of Tarantella?

You log out of Tarantella by clicking on the “X” icon on the webtop (not the web browser’s “X” button).

1.8 Answers to Exercise and Review Questions

This section contains the answers to exercises, review questions, and labs presented in this lesson.

Exercise answers

Please consult your instructor if you have any questions about the exercises in this lesson.

Review Question Answers

This section contains the answers to the review questions on page 1-35.

1. Tarantella is non-invasive and customizable. Tarantella provides access to diverse clients and to Unix and Windows applications. Tarantella provides resumable session. The AIP protocol enables Tarantella to dynamically adjust to fit the current bandwidth. Tarantella provides secure communications.
2. You log into Tarantella by typing *http://server/tarantella* in a web browser, where *server* is the name of the Tarantella server.
3. The Tarantella webtop enables users to start applications, view documents, control printers, and read on-line help.
4. You log out of Tarantella by clicking on the “X” icon on the webtop (not the web browser’s “X” button).

2

Installing Tarantella

Instructor Guide

Instructor Guide

Lesson 2

Installing Tarantella

Suggested lesson duration

This lesson should take approximately 1.5 hours to complete including the lab.

Pre-lesson classroom preparation

The classroom network needs to be setup properly (clients installed, DNS updated, etc.). Aside from this, make sure you have the Tarantella media to install from (whether by CD-ROM or via the web).

Instructor preparation

Read the following articles in the **Admin Guide**:

- How to... ⇒ Advanced ⇒ To Uninstall Tarantella
- Reference ⇒ Installation and Setup ⇒ What Setup does
- Reference ⇒ Installation and Setup ⇒ Tarantella installation tree layout
- Reference ⇒ Unix Commands ⇒ The Tarantella uninstall command
- Reference ⇒ Unix Commands ⇒ The Tarantella license command
- Reference ⇒ Licensing ⇒ Licensing overview
- How to... ⇒ Get started ⇒ To configure your webserver for use with Tarantella

Read the Tarantella FAQ at <http://tarantella.sco.com/info/faq.html>.

Introduction

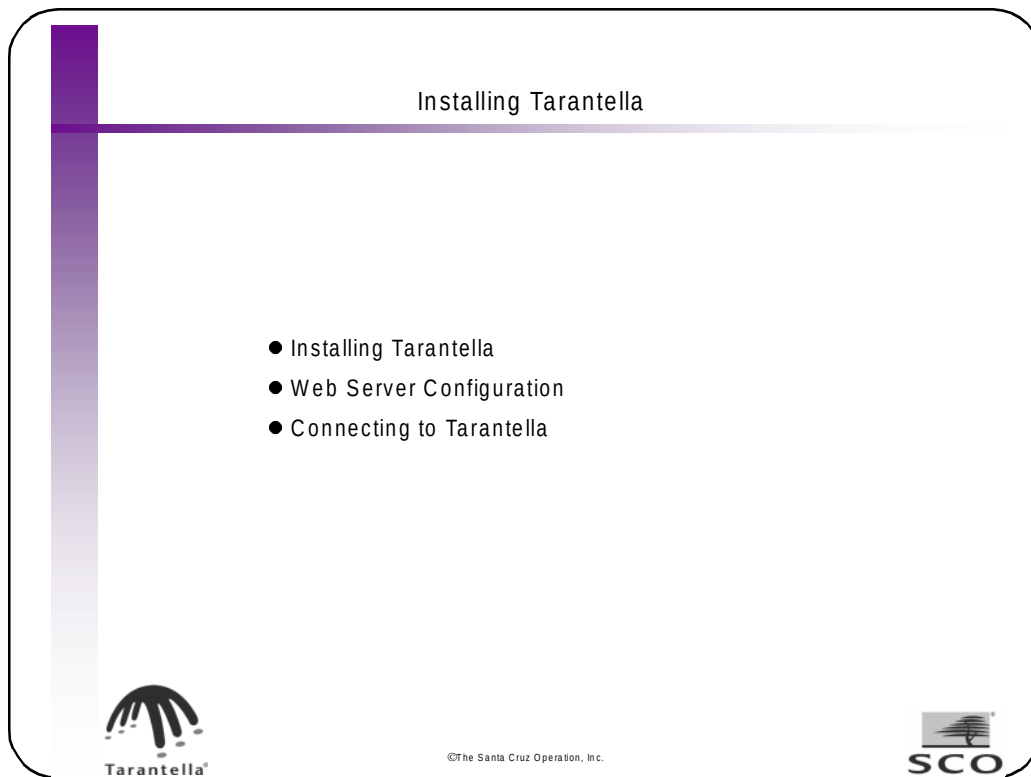
The installation and removal mechanisms in Tarantella Express have been designed to be reliable and easy to use. To install Tarantella on a server, the administrator should install the Tarantella base software, install any additional Tarantella Packs, and configure the web server

Objectives

By the end of this lesson, you will be able to:

- Install Tarantella
- Configure the Netscape FastTrack server or Apache for use with Tarantella
- Connect to a Tarantella server

AV 2-1



Topics

In order to meet these objectives, this lesson discusses:

- Installing Tarantella — Discusses how to install Tarantella from CD-ROM (or from an archive). Also discussed are procedures for licensing and removing Tarantella.
- Web Server Configuration — Discusses how to configure the Netscape FastTrack Server or Apache for use with Tarantella.
- Connecting to Tarantella — Shows how to connect to a Tarantella server.



AV 2-1: Installing Tarantella

The first slide describes the overall topics covered in this lesson.

2.1 Installing the Tarantella Express Base Product

The installation and removal mechanisms in Tarantella have been designed to be reliable and easy to use. To install Tarantella on a server, the administrator should install the Tarantella base software, install any additional Tarantella Packs, and configure the web server to allow Tarantella to be accessed.

The Tarantella server software itself installs exclusively on the second-tier.

2.1.1 Tarantella Express server requirements

The Tarantella Express server software runs on the following platforms:

Emphasize to students that this is a list of platforms that Tarantella runs on. This is not a list of the platforms that can serve as application servers.

- UnixWare®
- OpenServer
- Linux

As of February 2000, the Linux versions of Tarantella Enterprise II and Tarantella Express are not yet released.

2.1.2 Distribution media

The Tarantella server software is distributed two ways:

Via the web

The Tarantella base product, along with the Windows Connectivity Pack and the Tarantella Security Pack can be downloaded from <http://tarantella.sco.com>. Web download is the primary method of distribution.

On CD-ROM

In special instances, SCO distributes the software on CD-ROM. This is not the primary method of distribution.

Table 1: Hints for Using CD-ROMs on SCO Platforms

SCO OpenServer 5	<code>mount -f HS -o ro,lower /dev/cd0 /mnt</code>
SCO UnixWare 7 SCO UnixWare 2.1	<code>/usr/sbin/mount -rF cdfs /dev/cdrom/cdrom1 /mnt</code>

2.1.3 Installation procedure

To install Tarantella:

Step 1. Log in as **root**.

There is no single-user mode requirement.

Step 2. Mount the CD-ROM.

Step 3. Disable any web servers on the system so that Tarantella Express can install the Apache web server. For example, if you are running Netscape[®] FastTrack Server[®] on UnixWare 7, execute the following command:

```
# nsfast disable
```

If you fail to do so, Tarantella is unable to automatically set the document directory and the cgi-bin directory for Tarantella under Netscape FastTrack server. You will have to do so manually.

Step 4. Run the following command:

```
sh tta_file.shx
```

where *tta_file.shx* is one of the following file s:

Table 2: Tarantella Express SHX File Names

Platform	SHX File name
SCO OpenServer Release 5.0.2+	<i>ttxi3sc.shx</i>
Additional Platforms	TBA

GuruNotes .shx files are a concatenation of a shell script and a compressed datastream. The datastream is in pkgadd format. The .shx shell scripts take care of issuing all of the necessary pkgadd related commands for the particular platform (including installing a functional version of pkgadd, if necessary!).

GuruNotes The file name naming scheme is as follows:

product_name(3 chars)
chipset (2 chars)
operating system(2 chars)

tta = The product's prefix

i 3 = Intel 386

u n = UnixWare

Step 5. Follow the on-screen prompts.

There is no need to start Tarantella after the installation. It has already been started by the installation. Similarly, you needn't do anything to make Tarantella restart upon reboot. The installation sets up Tarantella to automatically start upon reboot.

Installing the Tarantella Security Pack and the Windows Connectivity Packs is performed in the same manner (ie. locate and run the appropriate *.shx file).

2.2 Removing Tarantella Express

Tarantella is removed using the steps shown in this section. The online documentation should be consulted for further details before the removal is attempted.

- Log in as root on the UNIX system on which Tarantella is to be removed.
- Run this command:

```
/inst_dir/bin/tarantella --uninstall
```

where *inst_dir* is the directory in which Tarantella was installed (usually */opt/tarantella*).

- The Tarantella datastore will not be removed from the system by the uninstall (for upgrade reasons etc.), thus the directory */var/tarantella* and its contents may need to be removed manually.

For more information on how to remove Tarantella, see **How to... ⇒ To Uninstall Tarantella** in the *Admin Guide*.

2.3 Licensing Tarantella Express

By default Tarantella installs in a 60-day evaluation mode. Tarantella can be used during this trial period. However once the period expires, the Tarantella server will no longer start until it is properly licensed.

There are no functional differences when running in evaluation mode.

To license a Tarantella server, issue the following command:

```
# tarantella license --add license_num
```

where *license_num* is a valid Tarantella license.

The Tarantella license cards supply both a serial number and an activation key. Use the activation key in place of the *license_num* used in the **tarantella license** command above.

Make sure students understand where the tarantella utility lives and how to invoke it even though it does not reside in \$PATH.

Further information on licensing can be found in the Admin Guide. In particular, see Reference ⇒ Licensing ⇒ Licensing Overview.

Contact your reseller or distributor to purchase additional licenses.

2.4 Web Server Configuration

Tarantella Express includes the world's most popular webserver, Apache. The Tarantella Express installation automatically configures Apache. You can, however, use other web servers.

2.4.1 Netscape FastTrack Server

To configure the Netscape web server for use with Tarantella, follow the steps presented in this section of the training. It is assumed that the web server has already been installed.

- Connect to the Netscape Admin Server (see the Netscape documentation).
- Click on **Install a new Netscape FastTrack Server** and accept the default settings.
- Click on **Configure more about your new serve** , press the **Content Mgmt** button, and then click on “**Additional Document Directories**”. Set the URL prefix “<server>/tarantella” to map to */opt/tarantella* (assuming a default Tarantella installation has been performed). Press the **OK** button and then click on **Save and Appl** .
- Click on the **Programs** button and set the URL “<server>/tarantella/cgi-bin” to map to */opt/tarantella/cgi-bin*. Press the **OK** button and the click on **Save and Apply**.

The Netscape FastTrack server can be started and stopped with the **nsfast enable** and **nsfast disable** commands, respectively.

2.4.2 Apache

In some versions of Apache, the configuration file is called *srm.conf*.

There appears to be no restriction on where these lines can be added to the configuration file, but it would seem a good idea to group them with other similar settings. The specified changes are based on a default installation of Tarantella.

The Apache web server is installed automatically by Tarantella Express provided no other web server is running when Tarantella Express is installed.

2.4.3 Other web servers

The web server running on the platform where Tarantella is installed must support CGI 1.1. Configuration information about other web servers can be obtained at <http://tarantella.sco.com/knowho>.

CGI 1.1 has been around for quite some time. Most web servers have supported CGI 1.1 since 1993.

To determine what http server is running (if any) on a server, execute “`ps -ef | grep httpd`”. Not only will this help identify the http server, it usually helps to identify the configuration file used by that http server (the arguments to the httpd command usually includes the configuration file name). In the networking chapter, we’ll show how to telnet to the web server and query the server directly.

2.5 Testing the Installation

Test the Tarantella installation by connecting to Tarantella. Connect by typing:

<http://server/tarantella>

where *server* is the name of the Tarantella server.

A login screen will be displayed if the connection is successful.

2.6 Lesson Summary

This lesson described how to install, license, and remove Tarantella. Additionally, this lesson described how to configure a web server to work in conjunction with Tarantella. Finally, this lesson described how to verify a Tarantella installation by connecting to the server via a web browser.

2.7 Review questions

1. On which platforms does the Tarantella server run?

The Tarantella Enterprise II server runs on the following platforms: UnixWare, Solaris, OpenServer, AIX, HP-UX, and Digital Unix (Tru64).

The Tarantella Express server currently runs on OpenServer and UnixWare.

2. Tarantella is installed by running the appropriate *.shx file. How is Tarantella removed?

Tarantella is removed by running:

```
/inst_dir/bin/tarantella uninstall
```

where *inst_dir* is the installation directory into which Tarantella was installed (typically */opt/tarantella*).

3. Which directory should you consider removing after removing Tarantella?

The */var/tarantella* directory remains after the removal of Tarantella. This is done to enable Tarantella to be removed and reinstalled without affecting the Tarantella datastore. In this way you can remove and reinstall Tarantella without affecting your organizational model.

4. What command would you need to issue to add a license to Tarantella?

To license a Tarantella server, you would issue the command “`tarantella license --add license_num`” where *license_num* is a valid Tarantella license.

5. What URL would you use to connect to Tarantella on a machine called `www.example.com`?

The URL is <http://www.example.com/tarantella>.

The Apache configuration file *srm.conf* (usually found in */usr/local/apache/conf*) must be modified to include the following lines (in the order shown):

```
ScriptAlias /tarantella/cgi-bin /opt/tarantella/cgi-bin
Alias /tarantella /opt/tarantella
```

2.8 Lab: Installing and Licensing Tarantella

In this lab, you will perform the steps necessary to install and license Tarantella. After doing so, you will test your Tarantella installation by connecting to the Tarantella server using a web browser.

2.8.1 Overview

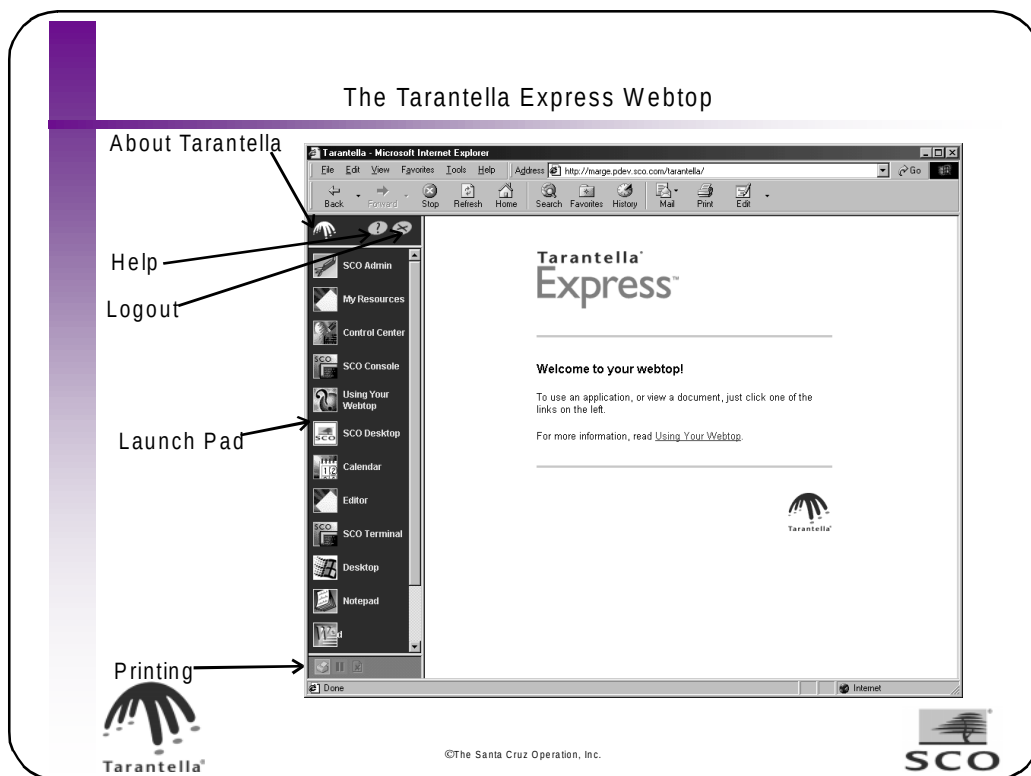
Your tasks in this lab are as follows:

- Install Tarantella
- Configure the web server
- License Tarantella
- Verify the Tarantella server installation by connecting to it with a web browser

The instructor will point you to the location of the tarantella software and license.

Make sure the students know where the software is (CD-ROM, via the web, etc.) and the exact name of the *.shx file that they will be installing. Provide the students with the license(s) that they are to use (if applicable).

AV 2-2



2.8.2 Procedure

Step 1. Log in as root.

Step 2. Verify that the web server is running. For example, if you are running Netscape FastTrack server on UnixWare, execute the following command:

```
# nsfast enable
```

Step 3. The installation of Tarantella will require 50MB in `/var/tmp`. Verify that this space is available by executing the following command:

```
# df space
```

If there is insufficient space, you can remedy this problem in either of the two following ways:

- Point the TMPDIR environment variable to a directory which contains sufficient disk space:

```
# TMPDIR=/directory/in/big/enough/filesystem
# export TMPDIR
```

- Alternatively, unmount the `/var/tmp` filesystem:

```
# umount /var/tmp
```

Insufficient space in `/tmp` will also cause problems (Tarantella uses a pipe file in `/tmp`). The symptoms are 1) the install dies silently or 2) the install fails with "Broken pipe".

Step 4. If directed to do so by the instructor, download the Tarantella `.shx` file for your platform. Otherwise `*.shx` file will be provided by the instructor.

Make sure students are clear whether they are getting the Tarantella software from the web, CD-ROM, etc.

Step 5. Execute the `*.shx` file by executing the following command:

```
# sh platform.shx
```

where `platform.shx` is replace with the platform specific name of your `*.shx` file.

For example, issue the following command on SCO OpenServer 5.0.5 systems:

```
# sh ttai3sc.shx
```

Step 6. As shown in AV 2-2, you will be prompted to accept, reject, or read the Software License Agreement.

Assuming that you have read and agree to the Software License Agreement, choose “yes” to accept the Software License Agreement.

AV 2-2: Installing Tarantella

Use this slide to illustrate the Software License Agreement prompt and the Tarantella defaults referenced in Step 6. and Step 7., respectively.

Step 7. As shown in AV 2-2, the installation lists defaults which you can accept or change. Accept the defaults.

Step 8. License Tarantella with the following command:

```
# /inst_dir/bin/tarantella license --add  
license_num
```

where *inst_dir* is the installation directory listed during the installation (see Step 7.) and *license_num* is replaced by a valid Tarantella license.

At this point the students need to map:

- */tarantella* to */opt/tarantella*, and
- */tarantella/cgi-bin* to */opt/tarantella/cgi-bin*

In their web server.

Step 9. Verify that Tarantella is running by connecting to it with a web browser. Use the following URL in the web browser:

<http://server/tarantella>

where *server* is the name of your Tarantella server. Log in and verify that Tarantella behaves as expected.

Step 10. Re-mount the */var/tmp* filesystem if previously unmounted in Step 3.

2.9 Answers to Exercise and Review Questions

This section contains the answers to exercises, review questions, and labs presented in this lesson.

Exercise answers

Please consult your instructor if you have any questions about the exercises in this lesson.

Review Question Answers

This section contains the answers to the review questions on page 2-18.

1. The Tarantella Express server currently runs on OpenServer and UnixWare.
2. Tarantella is removed by running:


```
/inst_dir/bin/tarantella uninstall
```


where *inst_dir* is the installation directory into which Tarantella was installed (typically */opt/tarantella*).
3. The */var/tarantella* directory remains after the removal of Tarantella. This is done to enable Tarantella to be removed and reinstalled without affecting the Tarantella datastore. In this way you can remove and reinstall Tarantella without affecting your organizational model.
4. To license a Tarantella server, you would issue the command “`tarantella license --add license_num`” where *license_num* is a valid Tarantella license.
5. The URL is <http://www.example.com/tarantella>.

3

Modeling an Organization

Instructor Guide

Instructor Guide

Lesson 3

Modeling an Organization

Suggested lesson duration

This lesson should take approximately four (4) hours to complete including the lab.

Pre-lesson classroom preparation

Tarantella must already be installed.

Instructor preparation

Read the following articles in the **Admin Guide**:

Introduction ⇨ Tarantella from a user's perspective

Introduction ⇨ Tarantella from a Tarantella Administrator's perspective

Introduction ⇨ Essential information for Tarantella Administrators

Introduction ⇨ Control Center

Introduction

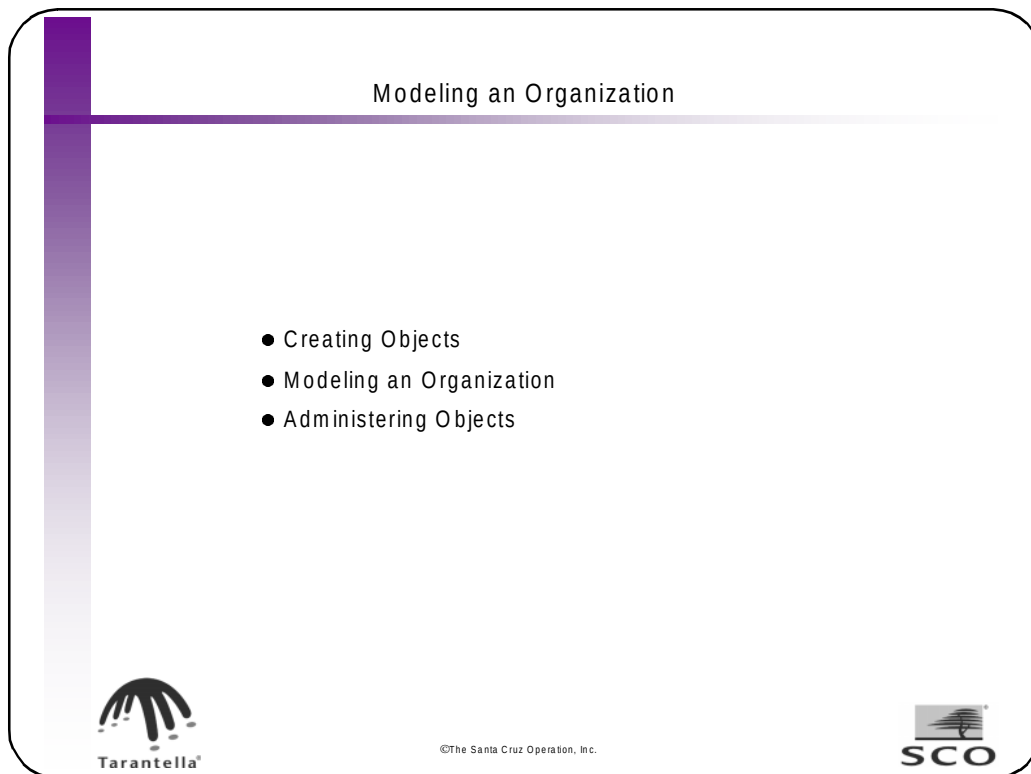
Control Center is the heart of Tarantella and nearly all of administration is done here. Control Center is a graphical administration utility. Conceptually, everything in Control Center is an Object. From the Organizational Units to the Applications to the People. Once you get the hang of navigating through Control Center, administering the Tarantella server is a breeze.

Objectives

By the end of this lesson, you will be able to:

- Create **Organizational Units**, **People**, and **Application** icons
- Allow Unix users and Anonymous users to log in
- Present different webtop content to different people or organizational units

AV 3-1



Topics

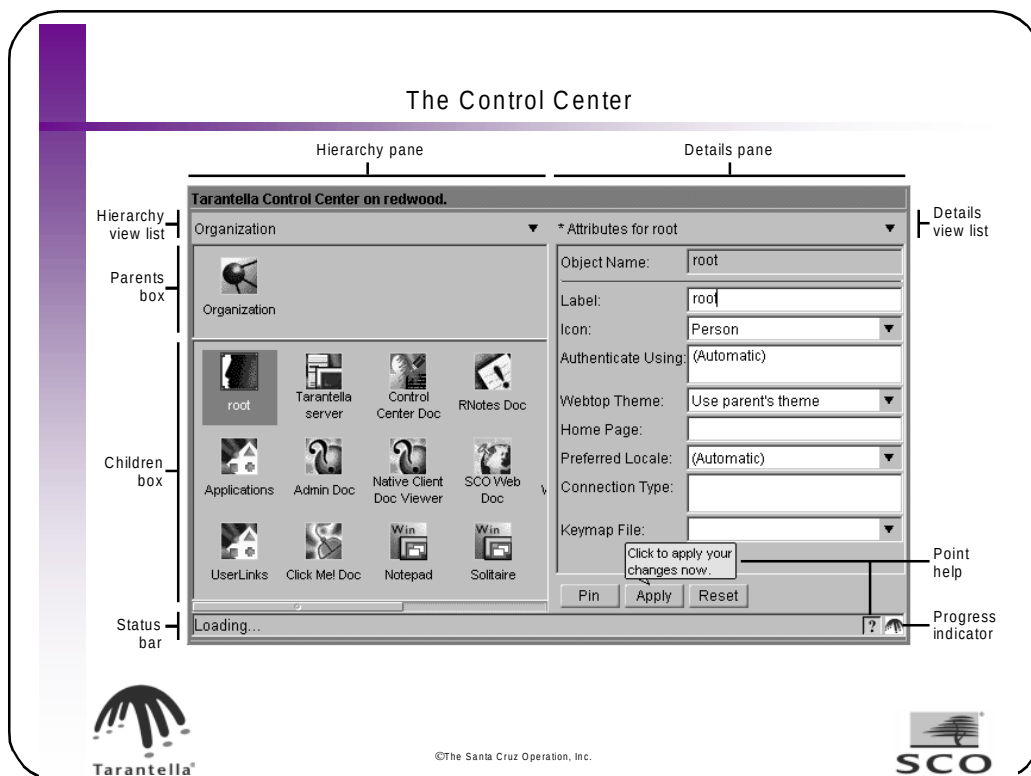
In order to meet these objectives, this lesson discusses:

- Creating objects — Discusses Organizational Unit, Person and Application objects and when to use each.
- Modeling an Organization— Discusses how to use Tarantella's hierarchal structure to implement a model of your organization that is easily administered.
- Administering objects — Discusses using Control Center for creating, moving, deleting objects, modifying security options and session management.

AV 3-1: Modeling an Organization

The first slide describes the overall topics covered in this lesson.

AV 3-2



3.1 Creating Users and Configuring Applications

Tarantella provides an easy to use graphical utility, Control Center, through which you can perform nearly all aspects of Tarantella administration.

3.1.1 Control Center

AV 3-2: Control Center

Use this slide to show the various parts of Control Center utility and their names.

Control Center lets administrators:

Tailor Tarantella to Their Organization	Your organization's resources — people, applications, and documents — are represented by objects in a hierarchy. Use Control Center to create and configure these objects, and structure them in a hierarchy which matches your organization's structure.
Customize Webtops	Use Control Center to configure exactly which links users see on their webtops.
Perform Housekeeping	Use Control Center to keep track of which applications users are running and maintain the password cache.
Configure Servers	Use Control Center to configure options which affect the server as a whole (eg. setting default timeouts or the login theme).

A set of powerful UNIX commands are also available which provide command line equivalents for many Control Center actions.

To run Control Center, simply log into Tarantella as an administrator (eg. the root account) and click on the **Control Center** icon.

Exercise: Running Control Center

Log into Tarantella as root and launch Control Center.

Control-clicking on the Control Center icon instructs Tarantella to launch Control Center in its own web browser

3.1.2 Adding a Tarantella user

Adding a Tarantella user is easy — just right click on the background of the **children box**. You will be presented with a menu. Select **New Object** ⇒ **Person**

Control Center presents a form to be filled out. The fields that need to be filled in include the following:

Object Name	From the user's perspective, the name you set here is the user name that the user will type when logging in. From Tarantella's perspective, this is the name of the object inserted into the Tarantella datastore that will hold all information related to this person.
Label	This is the name that will appear in Control Center on the icon that represents this user.

If the **Label** field is left blank, it defaults to the object name. Users always see the label, not the object name. In the future, the label will be localized with the correct language being displayed.

Authenticate Using	Tarantella has multiple ways of authenticating users: ● Tarantella users are described by a person object in the Tarantella datastore. The Authenticate Using field can be set to one of two values. In the exercise, you set the value to “_user/root”. This instructs Tarantella that when this user logs in, they must authenticate with root's Unix password. This form is used when the Tarantella account name does not match the Unix login name. Alternatively, this field can be set to “(Automatic)”. This instructs Tarantella that the Tarantella account name is the same as the Unix account's name. Again, the user uses the Unix account name when logging into Tarantella. This is used when there is a Unix account whose name exactly matches the Tarantella account name. ● Unix users don't have person objects associated with them. For this type of user, the administrator doesn't create a person object at all. Rather, the user simply logs into Tarantella using their Unix login name and password for their account on the Tarantella server. The Tarantella administrator can enable or disable this feature.
---------------------------	--

- An anonymous user is a user who doesn't have a person object in Tarantella, and doesn't have a Unix account. The Tarantella administrator can enable or disable this feature.

Exercise: Adding a Tarantella User

- | | |
|---------|---|
| Step 1. | In Control Center, right click on the background of the children box. |
| Step 2. | Select New Object ⇒ Person . |
| Step 3. | Type your first name followed by your last name into the Object Name field (eg. John Smith). |
| Step 4. | Type the same name in the Label field. |
| Step 5. | Type “_user/root” in the Authenticate Using field (don't type the double quotes). |
| Step 6. | Click on the Apply button. Be sure to wait until the button letters are grayed out. |
| Step 7. | Log out, then log back into Tarantella using your name and root's password. |

Exercise: Which Type of User Did You Create?

In the previous exercise, you created a user.

What type of user did you create?

A Tarantella user was created.

What password should the user provide when logging in as this user?

The user should provide the root password on the Tarantella server.

Was a person object created for this user.

A person object was created for this user.

Was a Unix account created on the Tarantella server for this new user?

No Unix account was created for this user on the Tarantella server.

3.1.3 Adding an application

Adding an application is just as easy as adding a person — just right click on the background of the **children box**. You will be presented with a menu. Select any of the following:

- **New Object ⇒ SCO Console Application**
- **New Object ⇒ VT420 Application**
- **New Object ⇒ X Application**
- **New Object ⇒ Wyse 60 Application**
- **New Object ⇒ Windows Application**

Installing the Cleo TN3270e connectivity pack adds 3720 applications as a choice in this list. Windows applications, on the other hand, are an available choice whether the Windows Connectivity Pack is installed or not. Adding the WCP provides a new protocol via which to launch Windows applications (ie. RDP through Tarantella)

Exercise: Adding an Application

- | | |
|---------|--|
| Step 1. | In Control Center, right click on the background of the children box. |
| Step 2. | Select New Object ⇒ X Application . |
| Step 3. | Set the Object Name and Label fields to “xeyes”. |
| Step 4. | Set the Application field to “/usr/X/bin/xeyes” (don’t type the double quotes). |
| Step 5. | Click on the Apply button. Be sure to wait until the button letters are grayed out. |

3.1.4 Deploying the application to a user

Before anyone can run the application you just configured, you must first deploy the application to a user.

Exercise: Giving the Application to a User

This exercise assumes that the student is still logged in as their Tarantella user.

- Step 1. Drag-and-drop the icon created in the previous exercise onto your Tarantella person object (ie. the icon with your name).
- Step 2. Log out of Tarantella and log back in. Alternatively, refresh/reload your web browser.
- Step 3. The Launch Pad will now contain a new icon labeled “xeyes”. Click on the icon to launch the application.

3.1.5 The Tarantella datastore

When you add objects such as person objects and applications objects to the organization hierarchy, Tarantella stores this configuration information in the *Tarantella datastore*.

The Tarantella datastore resides in the filesystem on the Tarantella server. The datastore is located in `/var/tarantella/database/database`.

The organization object that appears in the **parents box** in Control Center is stored in the Tarantella datastore as the directory `/var/tarantella/database/database/_ens/Org`.

If you have a person object at the top of the organization hierarchy whose **Object Name** is “root”, there will be a directory called `/var/tarantella/database/database/_ens/Org/root`. The **Object Name** determines the name used for the directory in the Tarantella datastore.

In each of these directories, there is a file called `.object`. This file stores the values for the various attributes you set when creating or modifying an object in Control Center.

Do not modify the `.object` file manually.

Exercise: Exploring the Tarantella Datastore

Change directories to `/var/tarantella/database/database/_ens/Org` and compare what you see in the directory (and its subdirectories) to what you see in Control Center.

You might show students how to examine the `.object` files using the `hd` command.

Exercise: Tarantella Federated Names

In the *Admin Guide*, read **Reference** ⇒ **Miscellaneous information** ⇒ **The Tarantella datastore and TFN names**. In particular, read the section which explains how a user can be identified by a Tarantella Federated Name.

3.2 Modeling an Organization

Now that you understand the basics of how administrators create Tarantella users and applications, we will discuss how to arrange these objects so that they best match your organization. Chances are that your “organization” is your company.

3.2.1 Hierarchal structure

In the preceding exercises, you created a person object and an application object. Both of these we deposited into the **children box**. While this works well for small numbers of such objects, it becomes unwieldy when working with larger numbers of objects.

Tarantella stores all of these objects in a *hierarchy*.

Later we’ll learn about a feature called *marks* which make it easier to work with large numbers of objects in the **children box**. But there is a more fundamental problem that marks alone can’t solve: Depositing all of the objects into the same place will make it extremely inefficient when deploying select applications to large numbers of users.

Just as dividing a company into multiple departments or divisions enables the company to run more efficiently, Tarantella’s *Organizational Units* enable the Tarantella administrator to group the various person and application objects into a more easily administered structure.

 Analogy: The various objects (eg. person, application, document, etc.) you create in Control Center are like *files* in a filesystem. Organizational Units, on the other hand, are like *directories* in a filesystem.

Exercise: Creating a Hierarchy

Step 1. In Control Center, create four new person objects.

The students can use whatever names they want. Furthermore, they can authenticate to whatever Unix account they want.

Step 2. Right click on the **children box**.

Step 3. Select **New Object** ⇒ **Organizational Unit**.

Step 4. Set the **Object Name** and **Label** fields to “San Francisco” (don’t type the double quotes).

Step 5. Click on the **Apply** button. Be sure to wait until the button letters are grayed out.

Step 6. Repeat steps 2 through 5 to create an organizational unit called “Santa Cruz” (don’t type the double quotes).

Step 7. Drag-and-drop two of the person objects you created in step 1 onto the “Us” icon. Drag-and-drop the other two person objects you created onto the “San Francisco” icon.

Step 8. Examine the contents of “San Francisco” by clicking the its icon. Notice that the **parents box** expands to include the “San Francisco” icon. Additionally, the **children box** contents are replaced with the contents of the “San Francisco” organizational unit’s contents.

Step 9. To back out of the “San Francisco” organizational unit, click on the “Organization” icon in the **parents box**.

Step 10. Repeat steps 8 and 9 examining the contents of the “Santa Cruz” organizational unit. Notice that its contents are different from the “San Francisco” organizational unit’s contents.

By creating these organizational units, you have given Tarantella a more hierarchal structure. By nesting organizational units, you can create a tree-like structure that mimics your own organization. Organizational units can be based on geography, departments, or any other categorization you choose.

3.2.2 Inheritance

Objects deeper in the tree inherit the properties and attributes of the objects above.

Exercise: Understanding Inheritance

Step 1. Log out and log into Tarantella as one of the newly created Tarantella users in the “Us.” organizational unit.

Step 2. Examine the applications available on the Launch Pad.

You did not give these applications to the user. How did the user end up with these applications on their Launch Pad? The answer is inheritance.

Step 3. Log back in as a Tarantella administrator and see if you can understand how the user ended up with the applications that appeared on their desktop.

Explain to the students exactly how the user ended up with these applications. Make sure students understand that they may receive applications (and other attributes) from the organization object or organization unit objects.

In general, Tarantella administrators on large systems don’t give applications to particular users. This approach becomes unwieldy with large numbers of users. Instead they create organizational units, place users in the those organization units, and then give applications to the organizational units.

Make sure students understand this point. Explain that they need to remove any applications from the organization’s webtop that they don’t want *everyone* to receive.

3.2.3 The home page attribute

In addition to deploying applications onto a user's webtop, the Tarantella administrator can place an icon for an *organizational unit* or a *person* onto the user's webtop. Instead of launching an application, clicking on the resulting webtop icon will display the web page specified in the organizational unit or person's **Home Page** attribute. This provides an easy means for the Tarantella administrator to inform other users on the system about the various organizational units and people on the system.

For those familiar with the old-fashioned **finger** command in Unix, this is analogous. Unlike **finger** which only knows about users, the **Home Page** attribute lets the Tarantella administrator provide information about people *and* organizational units.

When you drag-and-drop an application object onto a person object, you are *deploying* the application to that person's webtop. Clicking on the resulting webtop icon launches the application.

When you drag-and-drop an application object onto an organizational unit object, you are *deploying* the application to webtops of users in that organizational unit. Again, clicking on the resulting webtop icon launches the application.

On the other hand, when you drag-and-drop a person object onto an organizational unit, you are *moving* the person into the organizational unit. Clicking on the resulting webtop icon does not launch an application. Rather, it displays the specified home page.

You cannot move an organizational unit into another using the drag-and-drop method. Instead, you must be in the organizational unit where you want to create the embedded organizational unit.

Moving a person object into an organizational unit does not place the person on the webtop of the users in that organizational unit. To place a person object on the webtop of the users in an organization unit, you must right click the organizational unit's object, select **Webtop**, then drag-and-drop the person object onto the **details pane**. The same is true for placing an organizational unit object.

Demonstrate the home page attribute to the students. Students understand the home page attribute best when they see it demonstrated.

3.3 Creating Objects in Tarantella

Section 3.1.2 and Section 3.1.3 showed how to create user accounts and applications in Tarantella. In the sections which follow, we re-visit creating person and application objects. Additionally we introduce a new type of object: the document object.

For information about all of the object types supported by Tarantella, read the following article in the *Admin Guide*: **Introduction** ⇒ **Control Center** ⇒ **Type of object**.

3.3.1 Adding a user

In addition to the attributes we set on person objects earlier (Section 3.1.2), Tarantella administrators often change the following attributes:

Webtop theme:

This attribute determines which webtop theme is displayed for a particular user. Tarantella provides the following five choices:

- Standard
- Standard (no icons)
- Horizontal
- Maximum display area
- Use parent's theme

The first four choices are actual webtop themes. Webtop themes control the appearance of the user's webtop. You will see each of these webtops in the following exercise.

"Use parent's theme" instructs Tarantella to set the user's webtop theme to whatever its parent's webtop theme is.

Connection Type:

With the Tarantella Security Pack installed, administrators can enable secure SSL connections on a per-user, per-organizational unit, or organization-wide basis. This will be discussed at length in Lesson 6: "The Tarantella Security Pack."

Exercise: Setting the Webtop Theme

- Step 1. In Control Center, click the icon for the person object corresponding to the Tarantella account that you are currently logged into.
- Step 2. Change the **Webtop Theme** attribute to “Standard”.
- Step 3. Click on the **Apply** button. Be sure to wait until the button letters are grayed out.
- Step 4. Log out and log back in. Alternately, refresh/reload your web browser.
- Step 5. The appearance of the webtop should not have changed (assuming you’re not already leaping ahead of the instructor now that you’ve got the hang of Control Center).
- The webtop didn’t change because this user’s webtop theme already was “Standard”. The webtop theme was being determined from its parent.
- Step 6. Change your user’s webtop theme to “Standard (no icons)”.
- Step 7. Refresh/reload your web browser.
- Step 8. Observe the difference in the webtop appearance.
- Step 9. Repeat step 6 through step 8 using “Horizontal” and “Maximum display area” for the webtop theme.

3.3.1.1 Duplicate user names

What happens when two (or more) Tarantella users have the same user name? If the users have different passwords, then Tarantella determines which user to log in as based on the password supplied. If, on the other hand, the users have the same password, the user will be prompted with a combo box on the login screen which allows the user to specify which user they want to log in as.

 It's not entirely clear to some users that this is a combo box. Set this up for yourself to see what the pull down looks like and you'll see why it's unclear.

3.3.1.2 Other types of users

By default, users must have person objects to log into Tarantella. It is not necessary to create Tarantella person objects for everyone who connects to Tarantella. For that matter, it's not even necessary to have a Unix account. There are two types of users that can use Tarantella without the administrator having to create person objects: Unix users and anonymous users.

Unix users

Administrators can configure Tarantella to allow users to log into Tarantella using a unix account name and password. The only configuration necessary to allow this form of authentication is to enable this feature in Control Center by checking **Server** ⇒ **Security** ⇒ **Allow UNIX Login**.

■ Remind students, if necessary, to get to **Server** via the hierarchy view list.

By default, Unix users belong to the top-level organization. This can be changed by creating an organizational unit anywhere in the tree and setting **Server** ⇒ **Access** ⇒ **UNIX Users' OU** to point to the organizational unit's full object name.

All Unix users receive the same webtop and applications.

Exercise: Allowing Unix User Logins

- Step 1. Configure Tarantella to allow Unix user logins:
- Select **Server** in the Hierarchy View List menu.
 - Click on the **Security** object.
 - Check the **Allow Unix Login** box.
- Step 2. Create an organizational unit for Unix users:
- Select **Organization** in the Hierarchy View List menu.
 - Right click the background of the **children box**.
 - Select **New** ⇒ **Organizational Unit**.
 - Set the **Object Name** and **Label** attributes to “Unix Users” (don’t type the double quotes).
 - Click on the **Apply** button. Be sure to wait until the button is grayed out.
- Step 3. Drag-and-drop the xterm application object onto the Unix Users organizational unit.
- Step 4. Configure Tarantella so that the Unix Users organizational unit is used by Unix users:
- Select **Server** in the Hierarchy View List menu.
 - Click on the **Access** object.
 - Set the **Unix Users’ OU** attribute to the TFN for the Unix Users organizational unit: **.../_ens/Org/Unix Users**
- Step 5. Log out of Tarantella and log back in as a Unix user.
- Step 6. Observe that you can now log in as a Unix user and that the administrator can control what applications Unix users receive.

Anonymous users

When anonymous users login, they don't authenticate with a user name and password. All an anonymous user needs to do to login is to click on the login screen's "Ok" button.

To enable anonymous access, check **Server** ⇒ **Security** ⇒ **Allow Anonymous Login**. Additionally, for added manageability, create a separate Organizational Unit for Anonymous users and change the **Server** ⇒ **Access** ⇒ **Anonymous Users' OU** to that Organizational Unit.

An anonymous user logs in by using a slightly different URL:

<http://server/tarantella/kiosk.html>

where *server* is the name of the Tarantella server.

An anonymous user is given a random name each login. Therefore, features like Session Resumability will not work.

All anonymous users receive the same webtop content.

Exercise: Allowing Anonymous User Logins

- Step 1. Configure Tarantella to allow anonymous user logins:
- Select **Server** in the Hierarchy View List menu.
 - Click on the **Security** object.
 - Check the **Allow Anonymous Login** box.
- Step 2. Create an organizational unit for anonymous users:
- Select **Organization** in the Hierarchy View List menu.
 - Right click the background of the **children box**.
 - Select **New** ⇒ **Organizational Unit**.
 - Set the **Object Name** and **Label** attributes to “Anonymous Users” (don’t type the double quotes).
 - Click on the **Apply** button. Be sure to wait until the button is grayed out.
- Step 3. Drag-and-drop the xclock application object onto the Anonymous Users organizational unit.
- Step 4. Configure Tarantella so that the Anonymous Users organizational unit is used by Unix users:
- Select **Server** in the Hierarchy View List menu.
 - Click on the **Access** object.
 - Set the **Anonymous Users’ OU** attribute to the TFN for the Anonymous Users organizational unit:
.../_ens/Org/Anonymous Users
- Step 5. Log out of Tarantella and log back in as a Unix user.
- Step 6. You can now log in as an anonymous user and the administrator can control what applications anonymous users receive.

3.3.1.3 Tarantella administrators

At installation, root is given administrative rights for Tarantella. Other users can be granted administrative rights. To grant these rights to a user, right click the organization icon in the **parents box** and select **Administration**. The details pane on the right will show the users who are Tarantella administrators. Simply drop a person object onto the details pane to make them a Tarantella administrator.

Students might want to consider making another account that acts as a fallback in case they inadvertently lock themselves out of the root account.

3.3.2 Adding an application

In addition to the attributes we set on application objects earlier (Section 3.1.3), Tarantella administrators often change the following attributes:

Arguments: Many programs require arguments (eg. to specify file names, command line options, etc.). In the application object, you can pass in such arguments via the **Arguments** attribute.

Environment: Unix application objects (eg. SCO Console Application, X Application, etc.) allow you to pass in environment variables through the **Environment** attribute.

Display using: This attribute determines how applications are launched. Choices include:

- **Webtop**
- **New browser window**
- **Independent window**
- **Client window management**

You will see the differences between these in the next exercise.

Resumable: Tarantella allows three choices for application resumability:

- **Always** instructs Tarantella that the application keeps running even after the user logs out and can be resumed when they next log in.
- **Tarantella Session** instructs Tarantella that the application runs until the user logs out of Tarantella.
- **Never** instructs Tarantella that a new instance of the application is launched whenever the application's icon is clicked. The application is not resumable.

Exercise: Displaying Applications

- Step 1. Create a new X application object which runs /usr/X/bin/puzzle. Set the **Display Using** attribute to “Webtop”.
- Step 2. Give the application to a user
- Step 3. Log in as that user. Alternatively, just give the application to yourself and refresh/reload your web browser so that you don’t have to continuously log out and log back in.
- Step 4. Launch the application and observe how it is displayed.
- Step 5. Modify the **Display Using** attribute to “New browser window”.
- Step 6. Log out and log back in (or refresh/reload your web browser if you gave the application to yourself).
- Step 7. Launch the application again. Observe how it is displayed.
- Step 8. Repeat steps 5 through 7 setting the **Display Using** attribute to “Independent window” and “Client window management”.

3.3.3 Document objects

Document objects represent documents which you want to make available to users. Tarantella makes distributing these easy. Distributing a document simply consists of creating a **document object** which contains the URL pointing to the document.

Exercise: Distributing a Document

By now you should be getting the hang of administering Tarantella through Control Center. Create a document object. Set the **URL** attribute to the URL of a document you would like to make available to users (for example, <http://www.sco.com>). Don't forget to give this document to a user! Log in as that user and you will see the document on the user's Launch Pad.

Examine the URL associated with the **Click Me!** document. Notice that this document doesn't have a web address. Rather, it displays a document contained in the Tarantella datastore itself.

 In addition to URLs pointing to HTML documents, document objects can point to .txt files, .pdf files, etc.

3.3.4 Host and Host Group objects

Objects of these types are used in conjunction with Tarantella load balancing. These objects will be discussed in Lesson 7: "Tarantella Load Balancing."

3.4 Moving Objects

Thus far, you have configured Tarantella by dragging-and-dropping objects. This method becomes unwieldy when dealing with large numbers of objects or large hierarchies. As an alternative to the drag-and-drop method, you can *mark* objects that you want to move, making this process even easier than dragging-and-dropping.

To mark an object, simply right click the object and select **Mark**.

To move the marked object:

- Step 1. Right click on the object where you want to move the marked object
- Step 2. Select **Webtop**.
- Step 3. Right click in the details pane and select **Marks**, followed by the object you marked.

Using this same method, you can mark multiple objects and move all of them by selecting **Marks** ⇒ **Add all to webtop** from the menu that appears when you right click the target object's webtop.

What can be moved and where it can be moved depends on the object type.

- Applications can be moved onto Persons, Groups and Organizational Units
- Persons can be moved onto organizations
- Hosts can be moved onto Host Groups
- Host Groups can be moved onto Application Webtops
- Organizational Units can be moved onto other Organizational Units

The on-line documentation says that Organizational Units can be dropped onto other Organizational Units, but this appears to be false. This behavior was allowed in earlier versions of Tarantella.

When an object is moved to another Organizational Unit, the object will become a child of the new organization and not the previous organization. The object will disappear from the **Children View** of the previous Organizational Unit.

3.5 Trash

In Control Center, objects are deleted by right-clicking the object and selecting **Delete**. However, deleting an object doesn't actually remove it. Rather, the object is moved to an area of Control Center called **Trash**.

To view the trash:

- Step 1. Click on the **Default view list** menubar and select **Trash**.
- Step 2. The **Details pane** will display the trash.
- Step 3. From the **Details pane** the objects can be permanently deleted by right clicking the object and selecting "delete".

3.6 Lesson Summary

This lesson discussed how Tarantella can be configured to model the organization where Tarantella is being deployed. This is done in Tarantella by manipulating *objects* using Control Center. Objects discussed included person objects, application objects, group objects, and document objects.

Additionally this lesson discussed Unix users and anonymous users and creating other Tarantella administrators.

3.7 Review questions

1. What tasks does Control Center enable Tarantella administrators to perform?

Control Center enables Tarantella administrators to tailor Tarantella to their organization, customize webtops, perform housekeeping tasks, and modify server configuration settings.

2. What is the purpose of the **Authenticate Using** attribute in person objects?

The Authenticate Using attribute in person objects enables Tarantella administrators to specify to which Unix user account, if any, a particular Tarantella user authenticates.

3. How does Tarantella simplify administration tasks for administrators of large Tarantella servers?

Tarantella allows administrators to organize objects into a hierarchy.

4. What three types of users does Tarantella allow?

Tarantella allows Tarantella users (ie. users for whom a Tarantella person object exists), Unix users (ie. users who have a Unix account but no corresponding Tarantella person object), and anonymous users.

5. How can you make a user an administrator?

You make a user an administrator by right clicking the organization icon in the **parents box**, selecting **Administration**, and drag-and-dropping the user's person object onto the details pane.

6. How do you pass environment variables into applications launched by Tarantella?

You can set environment variables for particular applications by setting that application object's **Environment** attribute.

7. What happens if you delete an object in Control Center?

When you delete an object in Control Center, it is moved to the trash. To actually completely remove the object, you must delete the object from the trash.

3.8 Lab: Configuring Tarantella

This lab has students create numerous person objects and organizational units. If time is short, you can have the students create only a subset of these.

If students create the CDE application object, have students check the CDE application object's **View Host Reply** button and set **Session Ends When** to "Login script completes".

In this lab, you will configure Tarantella for our hypothetical company, Example Company, Inc. This will involve modeling the company in the Tarantella hierarchy, creating person objects, application objects, and organizational units.

3.8.1 Overview

Our hypothetical company, Example Company, Inc., is spread across two geographies:

- North America
- Europe

There are three departments:

- Sales
- Engineering
- Manufacturing

Sales and Engineering are located in North America. Manufacturing, on the other hand, is located in Europe.

The following table details the employees in each department and the login and password for their Unix accounts:

Table 3: Employees and Their Departments

Employee Name	Unix Account Login	Unix Account Password	Department Name
John Stratford	jstratford	apple	Manufacturing
Peter Larson	plarson	banana	Engineering
Suzy Quinn	squinn	cherry	Engineering
Mark Patton	mpatton	date	Sales
John Smith	jsmith	alpha	Sales
Alison McDonald	amcdonald	beta	Engineering
John Smith	johns	gamma	Manufacturing

The following table details which applications need to be deployed to each department:

Table 4:

Department	Applications	Location
Engineering	X Windows calculator Xedit text editor Real Time Performance Monitor	/usr/X/bin/xcalc /usr/X/bin/xedit /usr/sbin/rtpm
Sales	CDE Desktop Windows calculator	/usr/dt/bin/dtsession c:\windows\calc.exe
Manufacturing	“Notepad” text editor	c:\windows\notepad.exe

In addition to the applications above, Peter Larson has requested that he be given the vi text editor (*/bin/vi*).

Your tasks in this lab are:

- Design a hierarchy that represents this company.
- Implement this hierarchy by creating organizational units and person objects as necessary.
- Create any Tarantella users, Unix users, or anonymous users as necessary. When users log in, they must be able to do so with their full name rather than their Unix account name. For example, John Stratford would log in as “John Stratford” rather than “jstratford”.

■ The users should only create Tarantella users.

- Deploy the applications listed in Table 5. Consult with your instructor if you aren’t certain which type of application object to create for each application.

3.8.2 Procedure

■ These labs are designed to be performed under UnixWare 7.1.0.

Part I: Create the Organizational Units

In Control Center, create two organizational units, “North America” and “Europe” as follows:

- | | |
|---------|--|
| Step 1. | Click on the organization in the parents box to work your way to the top of the tree. |
| Step 2. | Right click on the background of the children box . Select New Object ⇒ Organizational Unit . |
| Step 3. | Set the Object Name and Label to “North America” (don’t type the double quotes). |
| Step 4. | If desired, change the Icon to one of your choosing. |
| Step 5. | Click on the Apply button. Be sure to wait until the button letters are grayed out. |
| Step 6. | Click on the “North America” object that you just created. Notice that the parents box changes is updated to show that you have gone into the North Americal organizational unit. |

- Step 7. Right click on the background of the **children box** and select **New Object** ⇒ **Organizational Unit**.
- Step 8. Set the **Object Name** and **Label** to “Sales” (don’t type the double quotes).
- Step 9. If desired, change the **Icon** to one of your choosing.
- Step 10. Click on the **Apply** button. Be sure to wait until the button letters are grayed out.
- Step 11. Right click on the background of the **children box** and select **New Object** ⇒ **Organizational Unit**.
- Step 12. Set the **Object Name** and **Label** to “Engineering” (don’t type the double quotes).
- Step 13. If desired, change the **Icon** to one of your choosing.
- Step 14. Click on the **Apply** button. Be sure to wait until the button letters are grayed out.
- Step 15. Click on the Organization in the **parents box** to work your way back to the top of the tree.
- Step 16. Repeat the steps above to create the “Europe” and “Manufacturing” organizational units.

Part II: Create the Users

Under Unix, create *Unix* user accounts for each of the Tarantella users in Table 4. How user accounts are created varies from one Unix platform to another, so you will have to read the documentation for your particular version of Unix. A good place to start looking would be to issue the following command:

```
# man -k user | more
```

Consult your instructor if you require help creating the Unix accounts.

 In UnixWare 7.1.0, students can use **scoadmin** ⇒ **account** or **useradd(1M)**.

Create the *Tarantella* person objects as follows:

- Step 1. Click on the organization in the **parents box** to work your way to the top of the tree.

- Step 2. Click on the “Europe” organizational unit in the **children box**.
- Step 3. Click on the “Manufacturing” organizational unit in the **children box**.
- Step 4. Right click on the background of the **children box**, and select **New Object** ⇒ **Person**.
- Step 5. Set the **Object Name** and **Label** attributes to “John Stratford” (don’t type the double quotes).
- Step 6. Assuming that the Unix account that you created for John Stratford is called “johns”, set **Authenticate Using** to “_user/johns” (don’t type the double quotes).
- Step 7. If desired, change the **Icon** and **Webtop Theme** to one of your choosing.
- Step 8. Click on the **Apply** button. Be sure to wait until the button letters are grayed out.
- Step 9. Repeat these steps for each Tarantella user. Be sure to place each user in the organizational unit indicated by Table 4.

Part III: Create and Deploy the Applications

- Step 1. Click on the organization in the **parents box** to work your way to the top of the tree.
- Step 2. Click on the “North America” organizational unit in the **children box**.
- Step 3. Click on the “Engineering” organizational unit in the **children box**.
- Step 4. Right click on the background of the **children box** and select **New Object ⇒ X Application**.
- Step 5. Set the **Object Name** and **Label** attributes to “X Calculator”.
- Step 6. Set the **Icon** and **Display Using** attributes as you see fit.
- Step 7. Set the **Application** attribute to the pathname of xcalc (ie. */usr/X/bin/xcalc*).
- Step 8. Click on the **Apply** button. Be sure to wait until the button is grayed out.
- Step 9. Repeat the steps above for each of the applications listed in Table 5. Don’t forget that John Stratford wants */bin/vi* in addition to the applications he receives as a member of the Manufacturing department.
- NOTE: For Windows applications, set the **Windows Protocol** attribute to “none” (don’t type the double quotes) and check the **Try Local Application** box. This will cause Tarantella to launch the application on the client machine — assuming it exists on the client — rather than on a third tier application server. We will learn how to run Windows applications on third tier servers in Lesson 8: “Windows Connectivity Pack.”

Part IV: Testing Your Work

Once you’ve set up your Tarantella hierarchy, test that you’ve succeeded:

- Check that you can log in as each user. Be sure to use the *Tarantella* user name.
- Check that each user receives the right applications.
- Verify that Peter Larson received */bin/vi* in addition to the applications he receives as a member of the Manufacturing department.

3.9 Answers to Exercise and Review Questions

This section contains the answers to exercises, review questions, and labs presented in this lesson.

Exercise answers

“Which Type of User Did You Create?,” on page 3-13

- What type of user did you create?
A Tarantella user was created.
- What password should the user provide when logging in as this user?
The user should provide the root password on the Tarantella server.
- Was a person object created for this user.
A person object was created for this user.
- Was a Unix account created on the Tarantella server for this new user?
No Unix account was created for this user on the Tarantella server.

Consult your instructor if you have any questions about any of the other exercises in this lesson.

Review Question Answers

This section contains the answers to the review questions on page 3-35.

1. Control Center enables Tarantella administrators to tailor Tarantella to their organization, customize webtops, perform housekeeping tasks, and modify server configuration settings.
2. The Authenticate Using attribute in person objects enables Tarantella administrators to specify to which Unix user account, if any, a particular Tarantella user authenticates.
3. Tarantella allows administrators to organize objects into a hierarchy.

4. Tarantella allows Tarantella users (ie. users for whom a Tarantella person object exists), Unix users (ie. users who have a Unix account but no corresponding Tarantella person object), and anonymous users.
5. You make a user an administrator by right clicking the organization icon in the **parents box**, selecting **Administration**, and drag-and-dropping the user's person object onto the details pane.
6. You can set environment variables for particular applications by setting that application object's **Environment** attribute.
7. When you delete an object in Control Center, it is moved to the trash. To actually completely remove the object, you must delete the object from the trash.

4

The Tarantella Native Client

Instructor Guide

Instructor Guide

Lesson 4

The Tarantella Native Client

Suggested lesson duration

This lesson should take approximately .5 hours to complete including the exercise. There is no lab. Instead, students install and use the Native client in the exercises.

Pre-lesson classroom preparation

The students must have Windows clients, and there must be at least one Tarantella server for the students to log into via the Native Client.

Instructor preparation

Read the following articles in the Admin Guide:

How to... ⇒ Getting users started ⇒ To make the Tarantella Native Client available

How to... ⇒ Getting users started ⇒ To allow native client users to display documents

Introduction

Certain web browsers do not support Tarantella well due to their implementation of Java[™]. Tarantella provides a Native Client which can be used in place of the web browser. This lesson discusses the installation and use of the Native Client.

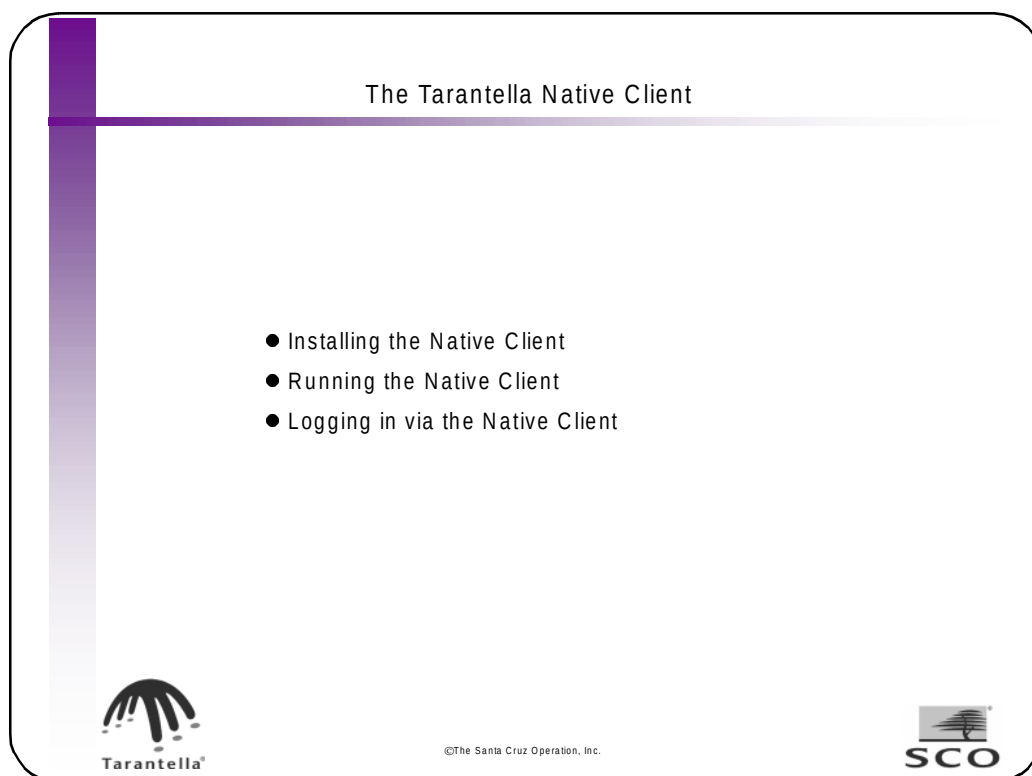
In reality, Tarantella provides more than one Native Client (eg. the 16bit version for Windows 3.1 versus the 32bit version for Windows 95/98/NT).

Objectives

By the end of this lesson, you will be able to:

- Install the Tarantella Native Client on Windows 3.1, 95, 98, or NT
- Run the Native Client
- Connect to Tarantella via the Native Client

AV 4-1



Topics

In order to meet these objectives, this lesson discusses:

- Installing the Native Client— Discusses how to install the Tarantella Native Client.
- Running the Native Client — Discusses how to invoke the Tarantella Native Client.
- Logging in via the Native Client— Explains how to log into a Tarantella server via the Tarantella Native Client.



AV 4-1: Installing Tarantella

The first slide describes the overall topics covered in this lesson.

4.1 The Tarantella Native Client

The Tarantella Native Client enables users to access Tarantella without the need for a Java enabled web browser.

4.1.1 Why does the Native Client exist?

Not all operating systems support Java equally well. For operating systems such as Windows 3.1, supporting Java is problematic at best. Native clients are created on an as-needed basis for the various platforms that Tarantella supports.

Benefits of the Native Client include:

- It needn't be installed on the client itself

That is, you can take the binary, put it on a file server, and let users access it via the network.

- It enables users to use the webtop without requiring a Java enabled web browser
- It works with the Tarantella Security Pack
- It is useful as a “control subject” when troubleshooting
- It is easy to install

4.1.2 Installing the Tarantella Native Client

To install the Native Client, point your web browser to the following URL:

<http://server/tarantella/cgi-bin/install.cgi>

Once on this page, select from either of the following two choices:

16-bit Tarantella Native Client for Windows 3.1

32-bit Tarantella Native Client for Windows 95, 98, NT server, and NT workstation

In Netscape Navigator®:

Step 1. Right click one of the hypertext links.

Step 2. Select “Save Link As...”.

NOTE: There is a known issue with the Netscape FastTrack Server that causes the above procedure to fail. If you are running Netscape FastTrack as your web server and are experiencing problems downloading the Native Client, review the following article in the **Release Notes: Tarantella Express for SCO UnixWare 2.1.2+ or UnixWare 7+**.

To quote the Tarantella Release Notes:

“By default, Netscape web servers treat files with “.exe” extensions as CGI programs to run on the server, rather than files to download to the client. To allow users to download the Tarantella Native Client, you should ensure your web server is configured correctly. You need to edit your web server's *mime.types* file (in the */usr/ns-home/httpd-80/config* directory in UnixWare 7), to remove “exe” as an extension for the “magnus-internal/cgi” type, and add it as an extension for the “application/octet-stream” type.”

After making these modifications, you must restart the Netscape FastTrack server.

In Microsoft Explorer:

Step 1. Right click one of the hypertext links above.

Step 2. Select “Save Target As...”.

This will download a file called either *ttawin16.exe* or *ttawin32.exe*, depending on which hypertext link you click on. These files are self extracting archives. Execute the file you downloaded.

If the Tarantella Security Pack is installed, the names of these files will be *tspwin16.exe* and *tspwin32.exe*.

AV 4-2

Logging into Tarantella via the Native Client

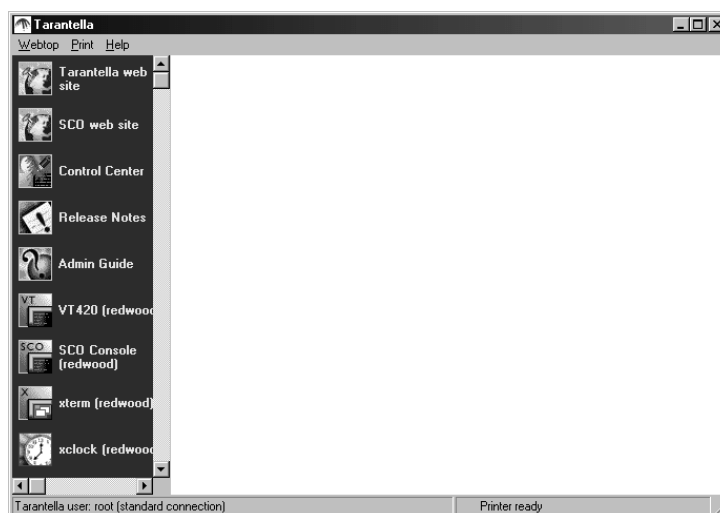


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AV 4-3

The Tarantella Native Client Webtop



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4.1.3 Running the Native Client

Under Windows 95, 98 or NT, you can execute the resulting binary (ie. the Native Client binary) by selecting:

Start ⇒ Programs ⇒ Tarantella ⇒ Tarantella Native Client

4.1.4 Logging into the Native Client

To log into Tarantella via the Native Client, fill out the login screen shown in AV 4-2. Supply a fully qualified host name, the Tarantella user name, and the password for that user.

AV 4-2: Logging into the Webtop via the Native Client

Use this slide to illustrate logging into Tarantella via the Native Client

The webtop is displayed in the Native Client as shown in AV 4-3.

AV 4-3: .The Tarantella Native Client Webtop

Use this slide to illustrate the webtop under the Native Client. Give a quick demo of the Native Client.

4.1.5 Native Doc Viewer

Tarantella's Control Center utility is a Java applet. Therefore the Native Client cannot run it. In situations like this, the Native Client will automatically invoke the client machine's registered web-browser, if any.

To configure which web browser is launched, in the **Admin Guide**, read **How to... ⇒ Get users started ⇒ To allow native client users to display documents**.

Exercise: Installing the Native Client

Install the Native Client on your client machine (modifying your Netscape web server configuration if necessary). Log into Tarantella via the Native Client.

4.2 Lesson Summary

This lesson described how to install, run, and log in via the Tarantella Native Client. The lesson also discussed a problem related to Netscape's FastTrack server and Tarantella.

4.3 Review questions

1. How do you download the Native Client?

The Native Client is installed as part of the base Tarantella installation. You can install the Native Client by visiting the following URL: `http://server/tarantella/cgi-bin/install.cgi`, where *server* is the name of your Tarantella server.

2. Does the Native Client have to be installed on the clients themselves?

No, the Native Client does not have to be installed on the clients themselves. The Native Client can be made available via a file server accessible to the clients.

3. Does the Native Client work in conjunction with the Tarantella Security Pack?

Yes, the Native Client does work in conjunction with the Tarantella Security Pack.

4.4 Answers to Exercise and Review Questions

This section contains the answers to exercises, review questions, and labs presented in this lesson.

Exercise answers

Please consult your instructor if you have any questions about the exercises in this lesson.

Review Question Answers

This section contains the answers to the review questions on page 4-13.

1. The Native Client is installed as part of the base Tarantella installation. You can install the Native Client by visiting the following URL: *http://server/tarantella/cgi-bin/install.cgi*, where *server* is the name of your Tarantella server.
2. No, the Native Client does not have to be installed on the clients themselves. The Native Client can be made available via a file server accessible by the clients.
3. Yes, the Native Client does work conjunction with the Tarantella Security Pack.

5

Printing under Tarantella

Instructor Guide

Instructor Guide

Lesson 5

Printing under Tarantella

Suggested lesson duration

This lesson should take approximately 2.0 hours to complete including the lab.

Pre-lesson classroom preparation

There must be at least one Unix server and one Windows server, each of which needs a configured printer.

Instructor preparation

Read the following articles in the *Admin Guide*:

How to... ⇒ Add a Tarantella Printer

Troubleshooting and Diagnostics ⇒ Printing ⇒ Configuring application servers for printing

Introduction

Tarantella's "Follow Me Printing" feature enables users to print from applications running on an application server onto the default printer on the client. In this chapter, we explore how this feature works and how you configure your servers to use it.

Objectives

By the end of this lesson, you will be able to:

- Add a Tarantella printer to a Unix application server
- Add a Tarantella printer to a Windows application server
- Print under Tarantella

AV 5-1

Printing under Tarantella

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



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Topics

In order to meet these objectives, this lesson discusses:

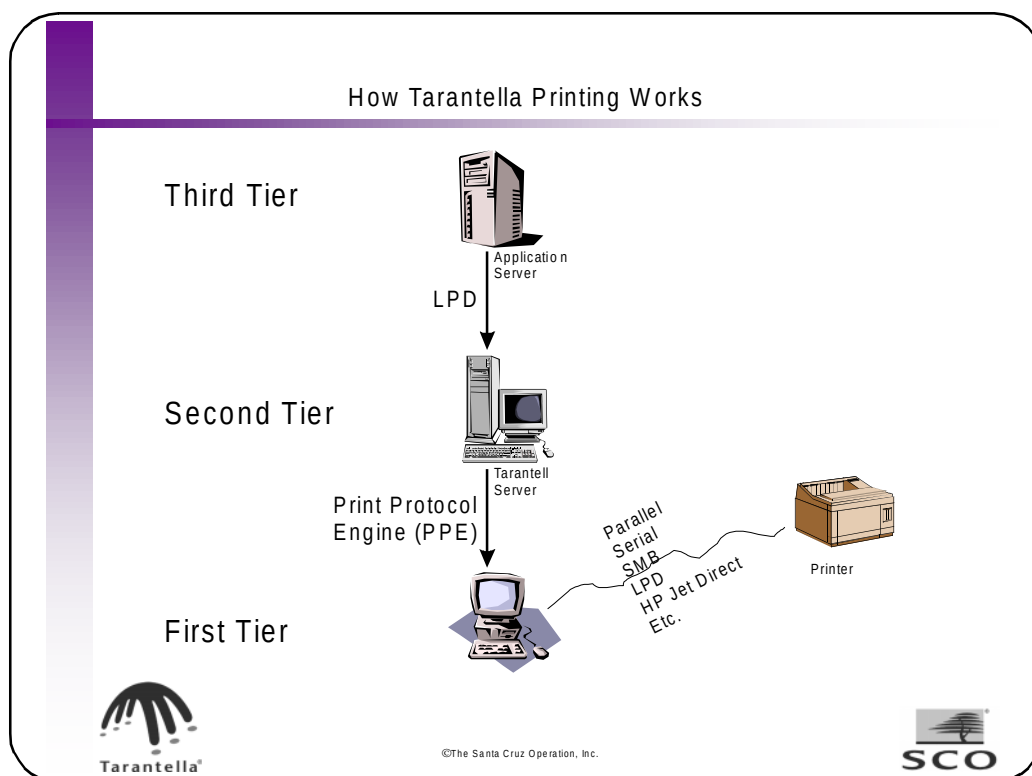
- How Tarantella Printing Works — Discusses how Tarantella gets print jobs submitted on application servers to the client's default printer.
- Configuring a Printer — Discusses how to configure a printer under Tarantella.
- Submitting Print Jobs under Tarantella — Explains how to print from Unix or Windows servers under Tarantella.



AV 5-1: Printing under Tarantella

The first slide describes the overall topics covered in this lesson.

AV 5-2



Instructor Guide

5.1 How Tarantella Printing Works

AV 5-2: How Tarantella Printing Works

Use this slide to illustrate how Tarantella printing works. In particular, show the protocols used by Tarantella and the protocols that the client's printer may use.

As you already know from earlier lessons, Tarantella enables users to launch applications which reside on a variety of application servers. These application servers may be running Unix or Windows.

When a user prints from a client machine, Tarantella's role is to see that the print job is transferred from the application server to the client's default printer.

Tarantella accomplishes this by transferring the print job from the application server to the Tarantella server via LPD.

The Tarantella server hands the print job off to the client using the Print Protocol Engine (PPE).

Once the client has accepted the print job, it's up to the client to print the file. This enables the client to print via Tarantella to any type of printer supported by the client.

Explain the three printer buttons on the webtop.

If you change the default printer on the Windows client, the printer button on the webtop still displays the old default printer. Furthermore, print jobs submitted will appear on the old default printer. You can force Tarantella to recognize the new default printer by simply refreshing/reloading your web browser.

5.2 Configuring a Unix Server for Tarantella Printing

While there is a fair amount of similarity in how different Unix platforms administer printers, there are enough differences to challenge anyone trying to manually configure a printer.

Tarantella eliminates this challenge and makes configuring a printer easy by providing a *single* shell script called *prtinstall.en.sh* which can be run on any of the supported Tarantella platforms.

This shell script knows the details of each Unix platform so that you don't have to bother yourself knowing how to configure printing on each platform. All you have to do is to copy the shell script from a Tarantella server's */inst_dir/bin/scripts* directory (where *inst_dir* is the Tarantella installation directory) onto the application server and then invoke the script as follows:

```
# ./prtinstall.en.sh
```

NOTE: The *prtinstall.en.sh* script is run automatically during the installation of Tarantella. Therefore, it is not necessary to run *prtinstall.en.sh* on the application server if the application server is a Tarantella server.

It is, however, safe to run it multiple times.

To remove the Tarantella printer from an application server, login in as root and type the following:

```
# ./prtinstall.en.sh --uninstall
```

5.3 Configuring a Windows Server for Tarantella Printing

To install a printer on a Windows Terminal Server or Windows 2000 server:

- Step 1. Create an LPR printer on the Windows application server. This is accomplished by telling Windows to create a *local* printer and creating an “LPR” port.

This is the most confusing part of the procedure under Windows for several reasons. First, Windows calls LPD printers LPR printers. Second, you must specify that you want to create a “local printer”. This is because Windows creates a local “port” (similar to LPT1) used to print remotely. When you specify that you want to create a “local printer”, “LPR printer” will be one of the choices.

- Step 2. When configuring the new LPR port:
- For Name or address of server providing lpd, type the DNS name of the Tarantella server where the Tarantella user will log in.
 - For Name of printer or print queue on that server, type “tta_printer”
- Step 3. When prompted whether the printer will be shared with other network users, choose Not Shared.
- Step 4. Choose the printer model and manufacturer that most closely matches your client devices' default printer when prompted. If there's no close match, choose a PostScript printer

For more information on the steps to install a Windows printer are detailed in the online help documentation. In the *Admin Guide*, read **How to... ⇒ Add a Tarantella printer ⇒ To add a Tarantella printer on a Windows application serve** .

Under Windows 2000, you must have “Print Services for Unix” installed for follow-me printing to work. If it is not installed, select **Start ⇒ Settings ⇒ Control Panel ⇒ Add/Remove Programs ⇒ Add/Remove Windows Components ⇒ Other Network File and Print Services ⇒ Details ⇒ Print Services for Unix**.

5.4 Submitting Print Jobs under Tarantella

Printing is easy in Tarantella. All that is necessary to print from an application running under Tarantella is to print from the application!

If you're running a Windows program, select File ⇒ Print... from the application's menu. If you're at a shell prompt in an **xterm**, just use the **lp** command to submit the print job as usual.

In other words, just print from the application in whatever way you ordinarily would. As long as the printer prints to the default printer or prints specifically to a printer called "tta_printer", the print job will print out on the client's default printer.

Exercise: Submitting a Print Job under Tarantella

Launch an application (Unix or Windows) from the webtop and submit a print job.

5.5 Lesson Summary

This lesson described how printing works under Tarantella and how to configure Unix and Windows application servers to print under Tarantella.

5.6 Review questions

1. What is the name of the program that needs to be run on Unix application servers to configure printing under Tarantella?

■ The program that you run on Unix application servers to enable Tarantella printing is called *prtinstall.en.sh*.

2. What protocol does Tarantella use to transfer print jobs from the application server to the Tarantella server?

■ Tarantella uses LPD to transfer the print job from the application server to the Tarantella server.

3. What protocol does Tarantella use to transfer print jobs from the Tarantella server to the client?

■ Tarantella uses the Print Protocol Engine (PPE) to transfer print jobs from the Tarantella server to the client.

4. What is the default name of the Tarantella printer?

■ The default name of the Tarantella printer is "tta_printer".

5.7 Answers to Exercise and Review Questions

This section contains the answers to exercises, review questions, and labs presented in this lesson.

Exercise answers

Please consult your instructor if you have any questions about the exercises in this lesson.

Review Question Answers

This section contains the answers to the review questions on page 5-12.

1. The program that you run on Unix application servers to enable Tarantella printing is called *prtinstall.en.sh*.
2. Tarantella uses LPD to transfer the print job from the application server to the Tarantella server.
3. Tarantella uses the Print Protocol Engine (PPE) to transfer print jobs from the Tarantella server to the client.
4. The default name of the Tarantella printer is “tta_printer”.

6

The Tarantella Security Pack

Instructor Guide

Instructor Guide

Lesson 6

The Tarantella Security Pack

Suggested lesson duration

This lesson should take approximately 1 hour to complete including the lab.

Pre-lesson classroom preparation

You must have already installed the Tarantella Enterprise II base component on each host on which you want to install the Tarantella Security Pack.

Install the Tarantella Security Pack on the instructor's machine so that demos can be performed.

Instructor preparation

Read the following articles in the *Admin Guide*

How to... ⇒ Let your users access Tarantella securely

Reference ⇒ Security

Reference ⇒ Unix Commands ⇒ The Tarantella security command

Introduction

The Tarantella Security Pack is an add-on to Tarantella that protects communications between clients and the Tarantella server. By using the Tarantella Security Pack organizations can confidently extend the reach of applications beyond their internal LAN.

Objectives

By the end of this lesson, you will be able to:

- Install the Tarantella Security Pack
- Obtain an X.509 Certificate from a Certificate Authority
- Install an X.509 Certificate
- Enable Tarantella Security
- Connect to a Tarantella server running the Tarantella Security Pack

AV 6-1

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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Topics

In order to meet these objectives, this lesson discusses:

- Installing the Tarantella Security Pack — Discusses how to install the Tarantella Security Pack from CD-ROM or via the web.
- Obtaining an X.509 Certificate — Explains how to obtain an X.509 certificate from a Certificate Authority for use with Tarantella Security Pack.
- Installing an X.509 Certificate — Discusses how to install the X.509 certificate generated by a Certificate Authority on a Tarantella server.
- Enabling the Tarantella Security Pack — Details how to turn on the Tarantella Security Pack once the X.509 certificate has been installed.



AV 6-1: The Tarantella Security Pack

The first slide describes the overall topics covered in this lesson.

6.1 The Tarantella Security Pack

The Tarantella Security Pack is an add-on to Tarantella that protects communications between clients and the Tarantella server. By using the Tarantella Security Pack organizations can confidently extend the reach of applications beyond their internal LAN.

A Tarantella server without the Tarantella Security Pack installed uses standard connections for communication between client devices and Tarantella servers. A standard connection transmits all information in cleartext (unencrypted), encoding passwords to deter casual eavesdroppers. This is just as secure as using, for example, the telnet program to communicate between two UNIX hosts.

Actually it's *more* secure than telnet. Whereas telnet sends cleartext passwords, Tarantella obfuscates them using 24-bit encryption.

In environments where very high security is required, these standard security precautions may not be enough. For these situations, the Tarantella Security Pack is available. The Tarantella Security Pack can only help raise security levels as part of an ongoing security strategy. If you use the Tarantella Security Pack, we recommend that you also use HTTPS.

“https” is a unique protocol that is simply SSL underneath HTTP. You need to use “https://” for HTTP URLs with SSL, whereas you continue to use “http://” for HTTP URLs without SSL. The default “https” port number is 443, as assigned by the Internet Assigned Numbers Authority.

A Tarantella server with the Tarantella Security Pack installed can still use standard connections, but also offers SSL (Secure Sockets Layer) connections for communication between client devices and the Tarantella server. An SSL connection provides the following benefits:

Prevents eavesdropping	The Tarantella Security Pack encrypts all information before transmission.
Prevents tampering	The Tarantella Security Pack checks that a message hasn't changed between being sent by a client device and received by the server.
Prevents message forgery	The Tarantella Security Pack requires that the server prove its identity to client devices before communication can take place, and also guards against replay attacks.

The Tarantella Security Pack offers two levels of encryption: strong and standard. Your license for the Tarantella Security Pack determines which type of encryption you use, and it's not possible to change this.

Explain that the license determines the level of security provided.

Steps to installing and configuring the Tarantella Security Pack:

- Install the .shx archive
- Issue the **tarantella security certrequest** command to generate a CSR
- Cut-and-paste the CSR into www.verisign.com or www.thawte.com
- Cut-and-paste the X.509 certificate generated by Verisign/Thawte into the **tarantella security certuse** command
- Set the **Connection Type** attribute on person objects, organizational unit objects, and/or the organization object
- Issue the **tarantella security on** command

Once these steps have been performed, you can log into Tarantella via the web browser. Make certain that the machine portion of the URL used to log in matches the host name specified in the X.509 certificate. For instance, if the X.509 certificate contains the name "apple.example.com", then the following URLs will *not* work:

- <http://localhost/tarantella> Fails because the certificate doesn't specify "localhost"
- <http://apple/tarantella> Fails because the certificate doesn't specify "apple"

Instead you are limited to using the following URL:

- <http://apple.example.com/tarantella> Succeeds because the certificate specifies "apple.example.com"

Alternatively, you *can* use the machines IP address in the URL.

6.2 Installing the Tarantella Security Pack

The installation and removal mechanisms in the Tarantella Security Pack have been designed to be reliable and easy to use. The installation procedure is similar to the procedure detailed in Lesson 2: “Installing Tarantella.”

The Tarantella Security Pack software runs on the following platforms:

- UnixWare 2.1.2+
- UnixWare 7+
- SCO OpenServer 5.0.2+
- SPARC Solaris 2.5.1+
- IBM AIX 4.2+
- HP-UX 10.20+
- Compaq Tru64 UNIX 4.0d+
- Linux

6.2.1 Distribution media

The Tarantella Security Pack software is distributed two ways:

Via the web

The Tarantella Security Pack product (along with other Tarantella products) can be downloaded from <http://tarantella.sco.com>. Web-distribution is the primary method of distribution.

On CD-ROM

In special instances, SCO distributes the software on CD-ROM. This is not the primary method of distribution.

Table 5: Hints for Using CD-ROMs on SCO Platforms

SCO OpenServer 5	<code>mount -f HS -o ro,lower /dev/cd0 /mnt</code>
SCO UnixWare 7 SCO UnixWare 2.1	<code>/usr/sbin/mount -rF cdfs /dev/cdrom/cdrom1 /mnt</code>

6.2.2 Installation procedure

To install the Tarantella Security Pack, follow this procedure:

Step 1. Log in as root.

There is no single-user mode requirement.

Step 2. Mount the CD-ROM.

Step 3. Run the following command:

```
sh tsp_file.shx
```

where *tsp_file.shx* is one of the following file names:

Table 6: The Tarantella Security Pack SHX File Names

Platform	SHX File name
SCO UnixWare® 7+	tspi3un.shx
SCO UnixWare 2.1.2+	tspi3un.shx
SCO OpenServer Release 5.0.2+	tspi3sc.shx
HP-UX 10.20+	tsppahp.shx
IBM AIX 4.2+	tsprsai.shx
SPARC Solaris 2.5.1+	tspspsso.shx
Compaq Tru64 UNIX 4.0d+	tspax01.shx

Step 4. Follow the on-screen prompts.

6.3 X.509 Certificates

A digital certificate is an electronic “passport” that establishes your credentials when doing business or other transactions on the Web. It is issued by a certification authority (CA). It contains your name, a serial number, expiration dates, a copy of the certificate holder's public key (used for encrypting and decrypting messages and digital signatures), and the digital signature of the certificate-issuing authority so that a recipient can verify that the certificate is real.

Tarantella servers use X.509 certificates to prove their identity to clients. Clients use information supplied by the CA to decode the certificate and verify the server's identity.

Before you can use the Tarantella Security Pack, you'll need to provide the Tarantella server with an X.509 certificate. If you're using an array of Tarantella servers, you'll need one certificate for each server on which you install the Tarantella Security Pack.

If you use HTTPS you'll need *two* X.509 certificates -- one for your web server on port 80 and another for Tarantella on port 5307.

The Tarantella Security Pack does *not* enable SSL on the web server.

GuruNotes If you can access the private key, you can use the same certificate for both purposes. The Apache web server lets you do this, but many other web servers don't (eg. Netscape FastTrack Server). You may be able to access the private key needed to decrypt the web server's X.509 certificate. (You might need to decrypt the key first, using the tarantella security decryptkey command.) See the tarantella security certuse command for information about how to do this.

6.3.1 Obtaining an X.509 certificate for the Tarantella Security Pack

A valid X.509 certificate is required before SSL connections are available for Tarantella connections (ie. SSL connections on port 5307). The following are the steps to obtain a Certificate from a Certificate Authority:

Step 1. On your Tarantella server, generate a Certificate Signing Request (CSR) by typing the following command:

```
# tarantella security certrequest --orgname orgname
--country country --state state
```

where *orgname* is the official name of your organization, *country* is your organization's ISO 3166 country code (for example, US or DE), and *state* is the state or province where your organization is located. Double quote any arguments that contain spaces. For example: --state "New Mexico"

Step 2. Send this CSR to a supported Certificate Authority (CA) (eg. VeriSign or Thawte) by filling out the CA's on-line form(s). Consult your CA for details of any additional information they may require and payment information.

■ The easiest way to "send" the CSR is to cut-and-paste it into the web-based form at the CA's website.

Step 3. The CA will then supply you with a certificate which you can use with the Tarantella Security Pack.

- You can include additional information about yourself and your organization in the CSR, if you wish, by using additional attributes with the **tarantella security certrequest** command.
- The **tarantella security certrequest** command generates a new key with which to decode certificates. If you've already used the **tarantella security certrequest** command to generate a CSR and obtain a certificate, running the command again means Tarantella won't be able to decode the old certificate.
- If your CA lets you change the hostname stored in the certificate, make sure the certificate contains a fully qualified DNS name (eg. "seattle.example.com" rather than just "seattle").

■ The **tarantella security certinfo** lets you display information about CSRs and certificates

6.4 Supported Certificate Authorities

The Tarantella Security Pack supports the following Certificate Authorities and certificate types:

- VeriSign Secure Server ID

<http://www.verisign.com>

- Thawte Basic Web Server Certificate

<http://www.thawte.com>

Note, If you want to use an unsupported certificate type or CA with the Tarantella Security Pack, you need to follow the above steps to generate and submit a CSR and must also obtain the root certificate in PEM format for your certificate type. Consult your CA for details on obtaining the root certificate.

6.5 Installing an X.509 Certificate

Once you have obtained an X.509 Certificate from a supported CA, you will need to install it on the Tarantella host. The following is the command to install the Certificate:

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

This example assumes that you used the **tarantella security certrequest** command to generate a CSR, which you then sent to a Certificate Authority (CA). The CA returned a certificate to you, which you saved in a temporary file */tmp/cert*.

Alternatively, you can cut-and-paste the certificate.

■ If you cut-and-paste the certificate, omit the “< /tmp/cert” portion of the command above.

6.5.1 Enabling Tarantella security

Once you have installed a Certificate on your Tarantella host, you can enable Tarantella security by typing the following command on your Tarantella host:

```
# tarantella security on
```

This command will enable SSL connections on port 5307. Tarantella will use SSL connections for those users specified by the Tarantella administrator.

■ The command **tarantella security off** disables the Tarantella Security Pack.

6.5.2 The Control Center

The Tarantella Security Pack provides the administrator a large degree of control when configuring security on the Tarantella server. The administrator can set security properties on:

- The organization object
- Organizational unit objects
- Person objects
- Any combination of the above

On each of these types of object, the administrator can specify a set of rules which determine what type of connection:

- Standard
- SSL
- Deny

Furthermore, each of these rules can specify specific conditions under which each type of connection is used based upon the client's and/or server's:

- Name
- IP address
- Subnet

These rules are set by changing an object's "Connection Type" attribute in Control Center.

GuruNotes When a user logs into Tarantella, Tarantella determines which type of connection to use by looking at the user's person object's Connection Type attribute and working its way up until it finds a matching rule.

Demonstrate setting a "Connection Type" in Control Center.

6.5.3 Testing the Tarantella Security Pack configuration

Section , “Part VII: Test the Tarantella Security Pack Configuration,” on page 6-29 will illustrate how to connect to the Tarantella server to test the configuration of the Tarantella Security Pack.

6.6 Lesson Summary

This lesson described how to install the Tarantella Security Pack. Additionally, this lesson described how to obtain and install X.509 Certificates. Finally, this lesson described how to enable the Tarantella Security Pack and how to test it by connecting to the server via a web browser.

6.7 Review questions

1. On which platforms does the Tarantella Security Pack run?

The Tarantella Security Pack runs on the following platforms: UnixWare, Solaris, OpenServer, AIX, HP-UX, and Compaq Unix (Tru64).

2. What are the two levels of encryption offered by the Tarantella Security Pack?

The two levels of encryption offered by the Tarantella Security Pack are 128-bit Strong Cryptography (US and Canada only) and 40-bit Standard Cryptography.

3. Which Certificate Authorities does the Tarantella Security Pack support?

The Certificate Authorities supported by the Tarantella Security Pack are Verisign and Thawte.

4. What benefits does an SSL connection provide over standard connections?

SSL connections provide three benefits over standard connections:

- Prevent eavesdropping — SSL can encrypt all information before transmission.
- Prevent tampering — SSL can check that a message hasn't changed between being sent by a client device and received by the server.
- Prevent message forgery — SSL requires that the server proves its identity to client devices before communication can take place, and also guards against replay attacks.

5. What command do you use to request a CSR?

The command to request a CSR is **tarantella security certrequest**

6.8 Lab: Configuring the Tarantella Security Pack

In this lab, you will perform the steps necessary to install the Tarantella Security Pack. After doing so, you will generate a CSR, request a certificate from a Certificate Authority (CA), install and test the certificate by connecting to the Tarantella with a web browser.

If teaching the Tarantella Enterprise II Administration course, use UnixWare's dtterm throughout this lab so that cut-and-paste will work. If teaching the Tarantella Express Administration course, OpenServer's cut-and-paste capabilities are not as robust. Redirect the CSR in Part II into a temporary file, then use that file as the argument to the **--certfile** option of the **tarantella security** command.

Be aware of how cut-and-paste works in the following utilities:

- dtterm on Unixware uses **CTRL INS** for copy and **SHIFT INS** for paste.
- Netscape Navigator on Windows uses **CTRL C** for copy and **CTRL V** for paste.
- Netscape Navigator on Unix uses **ALT C** for copy and **ALT V** for paste.

Creating a backdoor administrator account case prevent locking yourself out when turning on security.

6.8.1 Overview

Your tasks in this lab are as follows:

- Download the Tarantella Security Pack or obtain it from the instructor
- Install the Tarantella Security Pack
- Generate a CSR by using the **tarantella security certrequest** command
- Obtain an X.509 Certificate from a Certificate Authority.
- Install the Certificate obtained from the Certificate Authority
- Enable Tarantella Security
- Configure Tarantella to use SSL connections
- Verify the Tarantella Security Pack and Certificates have been installed correctly by connecting to it with a web browser

The instructor will point you to where you can obtain the tarantella software and license.

Make sure the students know where the software is (CD-ROM, via the web, etc.) and the exact name of the *.shx file that they will be installing. Provide the students with the license(s) that they are to use (if applicable).

6.8.2 Procedure

Part I: Installing the Tarantella Security Pack

The first item of business is to install the Tarantella Security Pack.

Step 1. If directed to do so by the instructor, download the Tarantella Security Pack .shx file for your platform. Otherwise *.shx file will be provided by the instructor.

Make sure students are clear whether they are getting the Tarantella software from the web, CD-ROM, etc.

Step 2. Execute the *.shx file by executing the following command:

```
# sh platform.shx
```

where *platform.shx* is replaced with the platform specific name of your *.shx file. For example, issue the following command on SCO UnixWare 7 systems:

```
# sh tspi3un.shx
```

Step 3. If you are prompted that there is insufficient space in */var/tmp*, then remedy this problem in either of the following two ways:

- Point the TMPDIR environment variable to a directory which contains sufficient disk space:

```
# TMPDIR=/directory/in/big/enough/filesystem  
# export TMPDIR
```

- Unmount the */var/tmp* filesystem:

```
# umount /var/tmp
```

Once you have remedied this problem, return to Step 2.

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-----
MIIB1zCCAQAQAQAwVzELMAkGA1UEBhMCVVMxEzARBgNVBAgTCkNhbmG1mb3JuaWEx
GTAXBgNVBAQTEEV4YmUyYzE1Yy4xGDAwBgNVBAHTD3JlZHVkb2Qu2Hv
LmNvbTCBnzANBghk1G9w0BAQEFAAOBjQAwgYkCgYEA1W+qbAh5JTQAFsTxV2b
8JWYe6wFFJgRt089QA0TGOFdr899yL4hyLqYEjX8HZe/qypV8gbE4LwTmRPSRm
G+IjaNq2EBEAb3qdSuSHY8y2XMOVp/iKZQLQt+bNuneN1bDuyWQeWKA62i70IwPf
zhP0ot0K/qHdGALcteb/gekCAwEAAaAAHQA0GCSqGSIb3DQEBAUAA4GBAIdhk/Rv
z6ZterZb7I1Tr9gjVU5fyFtCVF/dovBx8RKzFeD3Nb80iD7f1zvxL3UlyBoV/f/k
dC0HmazAD8j3cbGII20vry9BKqbYYGmS1/++35h5RoahIqa8rVltSf7HzCA42t90I
GzUFgpcRpCOWDxAqV62NJ7//DzWEivvONURp
-----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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Part II: Generating a CSR

AV 6-2: The Tarantella Certrequest Command

Use this slide to illustrate the `tarantella security certrequest` command.

Once you have installed the Tarantella Security Pack, each host on which the Tarantella Security Pack is installed requires a valid X.509 certificate before SSL connections are available.

Step 1. Log onto the Tarantella server as root, start a dtterm, and generate a CSR by using the **tarantella security certrequest** command:

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

AV 6-2 on page 6-22 shows the output of this command. The output will include the hostname that will be used in the certificate. Verify that the hostname is correct.

- 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.

Step 2. After you accept the hostname, the command generates a CSR. Copy the CSR to the clipboard (ie. highlight the CSR and type `CTRL INS`). You must include the lines which read

“-----BEGIN CERTIFICATE REQUEST-----”

and

“-----END CERTIFICATE REQUEST-----”.

Including additional lines doesn't hurt.

Alternately, copy the CSR to the clipboard.

AV 6-3

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.

#



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Part III: Obtaining an X.509 Certificate

- Step 1. Using your web browser, open the following URL:

<http://www.thawte.com>

On the right hand side of the thawte webpage, there will be a link to “Free Trial Certificate”. Click on the link and paste (ie.   under Windows or   under Unix) your CSR into the space provided. Accept all of the defaults, and click the “Generate Test Certificate” button.

You will be asked to verify the information included in the CSR. Once you have verified the information on the screen, a certificate will be generated.

- Step 2. Cut-and-paste the certificate to a file called `/tmp/cert`. Do this by highlighting the certificate in the web browser and typing   under Windows or   under Unix.

Paste the certificate into the dtterm by typing the following:

```
# cat > /tmp/cert  
  under Windows or   under Unix  
 
```

Alternately, you can do Parts III and IV by doing a cut-and-paste, pasting the certificate directly into the **tarantella security certuse** command instead of pasting it into a file.

Part IV: Installing the X.509 Certificate

AV 6-3: The Tarantella Certuse Command

Use this slide to illustrate the certuse command.

- Step 1. On the Tarantella host, use the **tarantella security certuse** command to install the Certificate:

```
# /opt/tarantella/bin/tarantella security certuse <  
/tmp/cert
```

Where `/tmp/cert` is the name of the file to which you saved the certificate.

A summary of the certificate information will be displayed (see AV 6-3 on page 6-24), and you will have successfully installed the certificate.

AV 6-4

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.
# █
```



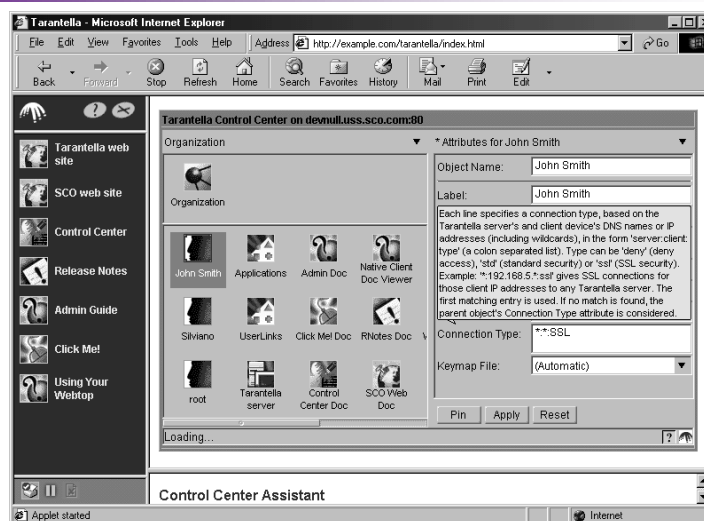
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Instructor Guide

AV 6-5

Configuring the Connection Type



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Part V: Enabling the Tarantella Security Pack

Enable the Tarantella Security Pack with the **tarantella security on** command. Slide AV 6-4 on page 6-26 shows the output of this command.

AV 6-4: Enabling Tarantella Security

Use this slide to illustrate the **tarantella security on** command.

Part VI: Configuring Tarantella to Use SSL Connections

AV 6-5: Configuring the Connection Type

Use this slide to illustrate setting a person object's connection type in the Control Center. Be sure to emphasize that the same can be done on an organizational unit or the entire organization.

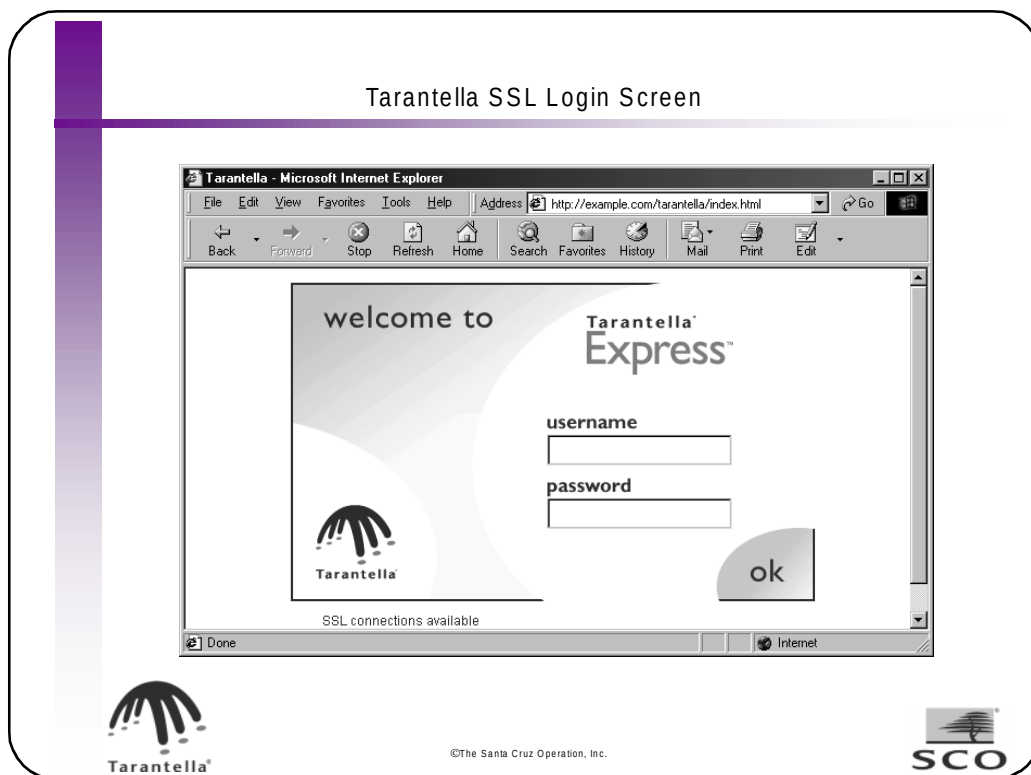
Now that you have enabled the Tarantella Security Pack, you can selectively enable SSL connections on a per person, per organizational unit, or organization wide basis. Simply select one of these three types of objects in the Control Center and set its **Connection Type** attribute to *** : * : SSL**.

Slide AV 6-5 on page 6-26 shows an example of setting the connection type for a person named John Smith.

AV 6-6



AV 6-7



Part VII: Test the Tarantella Security Pack Configuration

Test your installation of the Tarantella Security Pack and Certificate, by connecting to the Tarantella server from a client browser:

<http://server/tarantella>

where *server* is the name of the server upon which the Tarantella Security Pack is installed. Furthermore, the name specified for *server* in the URL *must* match the hostname stored in the X.509 certificate.

NOTE: A security warning will appear (see AV 6-6 on page 6-28). This warning is generated because the certificate you received from the CA was a test certificate. You can safely ignore this warning for this lab. Click on the **accept** button.

AV 6-6: Test Certificate Warning

Use this slide to illustrate the warning dialog that pops up when a test certificate is encountered.

A login screen will appear (see AV 6-7 on page 6-24). Notice on the bottom of the login screen the message stating that SSL connections are available.

AV 6-7: Tarantella SSL Login Screen

Use this slide to point out where the login screen announces SSL logins.

Recall that the Tarantella Security Pack provides the administrator a fine degree of control over which Tarantella users do and don't use an SSL connection. When you log in to a Tarantella server running the Tarantella Security Pack, you can determine whether you are logged in using SSL or a non-SSL connection by placing the cursor between two icons on the launch pad and examining the message on the web browser's status bar.

The lock icon displayed by web browsers such as Netscape Navigator indicate whether HTTPS is being used. The lock icon is *not* an indication of whether Tarantella is using a secure connection.

AV 6-8 on page 6-32 shows a non-SSL connection. AV 6-9 on page 6-32 shows an SSL connection.

AV 6-8: A Non-SSL Tarantella Login

Use this slide to point out where the webtop indicates a standard connection.

AV 6-9: An SSL Tarantella Login

Use this slide to point out where the webtop indicates an SSL connection.

■ As an additional lab, you could have students download the Native Client again. They'll get the TSP version.

AV 6-8

A Non-SSL Tarantella Login



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Instructor Guide

AV 6-9

An SSL Tarantella Login



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6.9 Answers to Exercise and Review Questions

This section contains the answers to exercises, review questions, and labs presented in this lesson.

Exercise answers

Please consult your instructor if you have any questions about the exercises in this lesson.

Review Question Answers

This section contains the answers to the review questions on page 6-19.

1. The Tarantella Security Pack runs on the following platforms: UnixWare, Solaris, OpenServer, AIX, HP-UX, and Compaq Unix (Tru64).
2. The two levels of encryption offered by the Tarantella Security Pack are 128-bit Strong Cryptography (US and Canada only) and 40-bit Standard Cryptography.
3. The Certificate Authorities supported by the Tarantella Security Pack are Verisign and Thawte.
4. SSL connections provide three benefits over standard connections:
 - Prevent eavesdropping — SSL can encrypt all information before transmission.
 - Prevent tampering — SSL can check that a message hasn't changed between being sent by a client device and received by the server.
 - Prevent message forgery — SSL requires that the server proves its identity to client devices before communication can take place, and also guards against replay attacks.
5. The command to request a CSR is **tarantella security certrequest**

7

Tarantella Load Balancing

Instructor Guide

Instructor Guide

Lesson 7

Tarantella Load Balancing

Suggested lesson duration

If you are teaching the Tarantella Enterprise II version, this lesson should take approximately 3 hours to complete including the lab.

If you are teaching the Tarantella Express version, this lesson should take approximately .5 hours to complete including the lab.

Pre-lesson classroom preparation

You must have already installed the Tarantella base component on each host.

Make sure that every host has the same version of Tarantella installed.

Each host that will become part of an array must have a web server installed and configured to work with Tarantella.

Instructor preparation

Read the following articles in the *Admin Guide*

How to... ⇨ Balance the load across multiple servers

Reference ⇨ Load balancing with arrays

Introduction

Tarantella Express servers act as application brokers — gateways between client devices and application servers. If many users want to access applications through Tarantella at the same time, a single application server may become a bottleneck. In addition, if that server is unavailable, users can't run applications.

Tarantella Express lets you spread your users across multiple application servers, rather than having everyone use the same server. Multiple servers provide these benefits:

Increased Performance	More application servers are available to cope with demand from users.
Increased Robustness	When an application server is unavailable, other servers take its place.
Scalability	As more users start using Tarantella, you can add application servers to meet demand.

If you have many users logging into Tarantella at the same time, you should consider using more Tarantella servers.

If you have many users running the same application at the same time, you should consider using more application servers.

Objectives

By the end of this lesson, you will be able to:

- Describe Tarantella Load Balancing
- Describe what is a Tarantella Array
- Describe Application Server Farms

AV 7-1

Tarantella Load Balancing

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



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Topics

In order to meet these objectives, this lesson discusses:

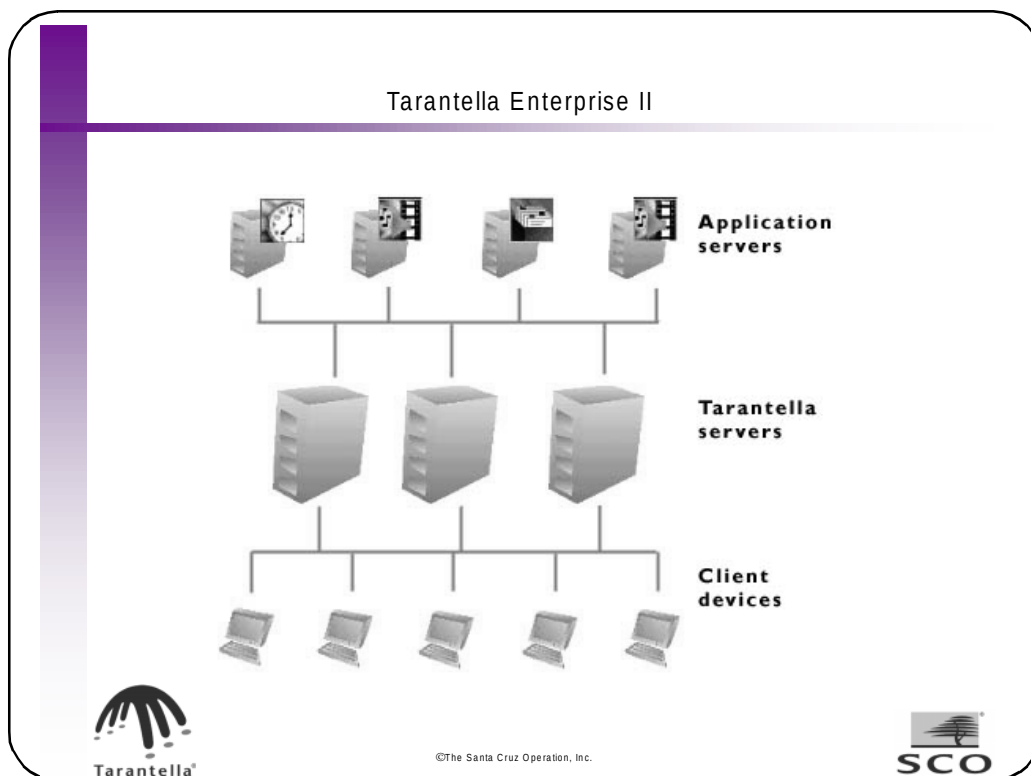
- Understanding Tarantella Load Balancing — Discusses the Tarantella load-balancing feature, which provides a mechanism for distributing users across available Tarantella servers.
- Understanding Tarantella Arrays — Defines the Tarantella arrays, and discusses its use in load balancing.
- Application Server Farms — Discusses the multiple application server features of Tarantella.
- Understanding the Tarantella Load Balancing Table — Discusses the purpose of the load balancing table, adding, removing and modifying of the load balancing table.



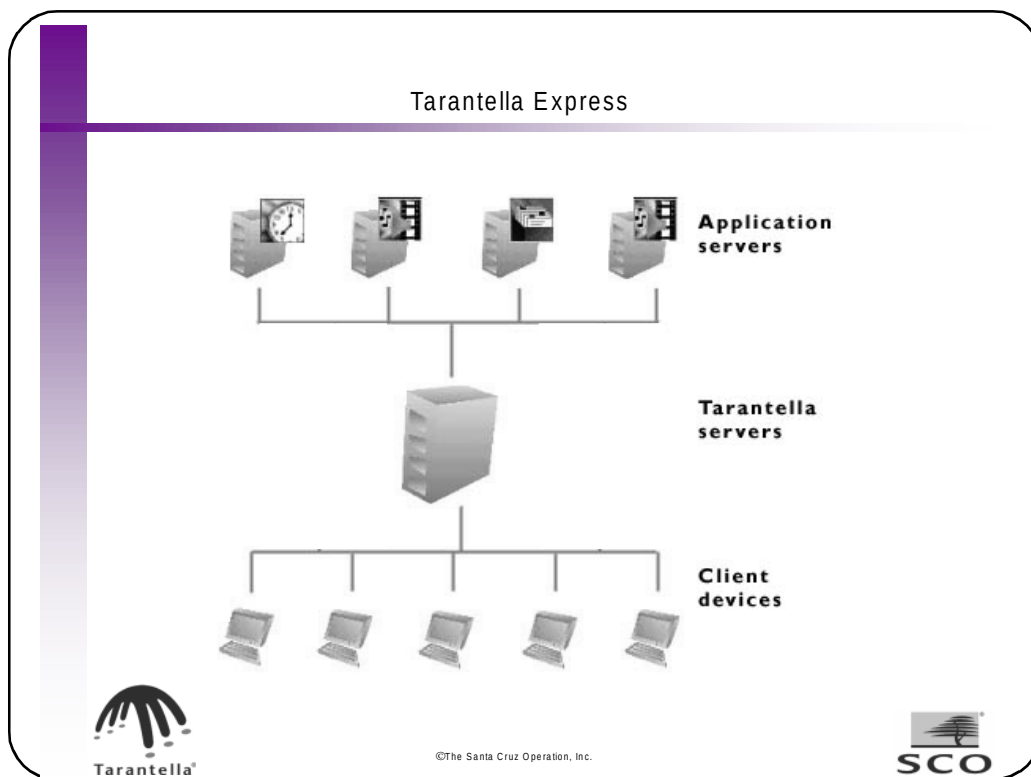
AV 7-1: Tarantella Load Balancing

The first slide describes the overall topics covered in this lesson.

AV 7-2



AV 7-3



7.1 Distributing the Load

AV 7-2: Tarantella Enterprise II

Use this slide to illustrate the Tarantella Enterprise II has *both* Tarantella arrays and application server farms.

AV 7-3: Tarantella Express

Use this slide to illustrate that while Tarantella Express allows application servers, only four application servers are allowed and Tarantella arrays are *not* supported. Tarantella Express users who want more than four application servers or support for Tarantella arrays must upgrade to Tarantella Enterprise II. There is a clear upgrade path to do this.

Tarantella Express enables the administrator to spread the load across up to four application servers. These application servers are known collectively as an application server farm.

Application server farms are comprised of multiple servers, each of which provides the ability to launch the same application or applications. This enables administrators to spread the load caused by running the application.

In addition to application server farms, Tarantella Enterprise II supports Tarantella arrays. Tarantella arrays enable administrators to spread the load associated with Tarantella logins. Tarantella arrays are comprised of multiple servers providing Tarantella services. These servers act cooperatively to enable users to log in to Tarantella. When a Tarantella user logs into a Tarantella array, the user is authenticated by one of the Tarantella servers in the array. The webtop that the user sees and the applications available to the user are the same regardless which Tarantella server in the array actually authenticates the user.

Tarantella arrays are not supported by Tarantella Express. Administrators requiring this functionality must upgrade to Tarantella Enterprise II.

GuruNotes Yes, Tarantella Express can have up to four application servers plus the Tarantella server itself can act as an application server.

7.2 Application Server Farms

Running an application on a particular application server (by specifying a DNS name or IP address in the application object's Application Server attribute) can cause a bottleneck.

For instance, if many users want to run the application at the same time, the application server may become overloaded causing a decrease in performance. If the application server is unavailable for any reason (perhaps because of network problems), users won't be able to run that application.

To address this issue, Tarantella lets you balance the application load across multiple application servers. Such a collection of servers is called an application server farm.

7.2.1 Multiple application servers

In order to configure multiple application servers, specify which application servers can run the application. When a user starts the application, Tarantella chooses one of these servers based on which servers are:

Available	If one application server is unavailable, Tarantella will choose another.
Under-used	Tarantella chooses the application server that is running the fewest applications via Tarantella.

To use multiple application servers in this way, you need to:

- Set the application object's **Application Server** attribute to **Use Hosts View**.
- Create a host object for each application server that can run the application.
- Add these host objects to the application object's Hosts view.

If you want to use multiple application servers to run a single application, the application must run in exactly the same way on each application server. This means the application must be installed in the same location on each application server.

7.2.2 Balancing applications across multiple application servers

In order to balance applications across multiple application servers:

- Step 1. Select **Organization** in the Hierarchy View List
- Step 2. Create a host object for each application server you want to run the application on.
- Step 3. Right-click the application object that represents the application you want to run on multiple application servers.
- Step 4. Select **Attributes**. The application object's attributes are shown in the Details pane.
- Step 5. Set the **Application Server** attribute to **Use Hosts View**.
- Step 6. Click **Appl** .
- Step 7. Right-click the application object again, then select **Hosts**. The Details pane shows the application object's Hosts view.
- Step 8. Drag the host objects for the servers you want to run this application from the Children pane into the application object's Hosts view.

When a user starts the application, Tarantella will choose one of the application servers from the application object's Hosts view based on load.

You can use host groups to collect host objects together, then add the host group to the application object's Hosts view.

You can also balance Tarantella sessions across multiple Tarantella servers to provide a faster, more robust service to your users.

Leaving the **Application Server** attribute blank instructs Tarantella to use the second tier machine as the application server.

7.2.2.1 Object attributes

Below is a list of the attributes you can set in Control Center for a host object. If you do not supply entries for each of the object's mandatory attributes, when you click **Appl**, Control Center will prompt you to do so (mandatory attributes appear in bold).

Object Name	The name of the host object in the Tarantella datastore. As with other object in Control Center, this name must be unique.
Label	The object's display name. On webtops this is the label shown for a link. In Control Center this is the tooltip for the object.
Icon	The name of an icon file to be associated with the object. You can choose one of the standard icons from the list of available icons. This list is part of an icon theme. If Tarantella can't find an icon file, it uses the default icon for the object type.
Host Name	The DNS resolvable name or (IP address) of the machine represented by this host object.
Try Tarantella Password	What to do if the user doesn't have a cached password entry.

AV 7-4: Tarantella Load Balancing

Use this slide to illustrate the location of the Tarantella servers in the three-tier architecture.

Tarantella servers in an array don't need to run the same operating system — an array containing three different servers (HP-UX, Solaris and UnixWare 7, for example) works just as well as an array containing three identical servers. All the Tarantella servers in an array must be running the same version of Tarantella, however.

It's important that users have accounts on all the Tarantella hosts that they might be redirected to. If a user is redirected to a Tarantella server running on a host that user doesn't have an account on, they won't be allowed to log into Tarantella. You can use NIS to ensure that all the hosts in an array use the same user information.

Each server in an array must have Allow Port Access enabled to allow replication of the organizational hierarchy between servers.

To create a new array, *p_server* must be a standalone Tarantella server. You can customize which servers a user may access when they log into Tarantella. You can add additional secondary Tarantella servers to the array at any time.

Tarantella servers in an array don't need to run the same operating system -- an array containing three different servers (HP-UX, Solaris and UnixWare 7, for example) works just as well as an array containing three identical servers. All the Tarantella servers in an array must be running the same version of Tarantella, however.

This command prompts a number of times for confirmation, once for each Tarantella server in the array

This is a great way to duplicate servers!

If the server's Can Redirect To Primary attribute is disabled, Tarantella treats the primary server as being unavailable when consulting the load balancing table.

- Users without an entry can still log in. An entry will be automatically created for them, with a random order of all servers in the array.
- Use a TFN name to specify person, for example `_user / ruby` or `".../_ens/Org/Marketing/ruby"`.

Users without an entry can still log in: an entry will be automatically created for them, with a random order of all servers in the array

Use a TFN name to specify person, for example `_user/ruby` or `".../_ens/Org/Finance/ruby"`.

- Use a TFN name to specify *person*. For example `_user/orange` or `".../_ens/Org/IT/orange"`.
- Use a DNS name or IP address to specify *server*.

Use a TFN name to specify person, for example `_user/rusty` or `".../_ens/Org/IT/rusty"`.

Use a DNS name or IP address to specify server.

Use a TFN name to specify *person*, for example `_user/rusty` or `".../_ens/Org/IT/rusty"`.

Use a DNS name or IP address to specify *server*

7.3 Lesson Summary

This lesson described how Tarantella load balancing works, described an array of Tarantella servers, and showed you how to create an array of Tarantella servers. Additionally, this lesson described application server farms, and how to balance applications across multiple application servers.

7.4 Review Questions

1. What are the benefits of Tarantella load balancing?

- Increased Performance
- Increased Robustness
- Scalability

2. What is a host object?

A host object represents an application server in the Tarantella datastore. Host objects allow you to balance applications across multiple application servers.

```
tarantella array join --primary p_server --secondary s_server ...
```

Tarantella uses the load balancing table to decide which server to redirect a particular user to when they access Tarantella.

The command to remove a server from an array is **tarantella array edit --detach server**

7.5 Lab: Creating an Application Server Farm

In this lab, you will perform the steps necessary to create an application server farm.

7.5.1 Overview

Your tasks in this lab are as follows:

- Create one host object for each application server
- Set an application object's **Application Server** attribute to **Use Hosts View**.

7.5.2 Procedure

The following steps detail how to create an application server farm.

Part I: Creating the Host Objects

Create a host object for each Tarantella server that will be a member of the array:

Step 1. Log into Tarantella as a Tarantella administrator.

Step 2. Run Control Center.

Create a host object for one of the application servers:

Step 3. Right click on the background of the children box.

Step 4. Select **New Object** ⇒ **Host**.

Step 5. Set the **Object Name** and **Label** attributes to the name of the application server.

Step 6. Set the **Host Name** attribute to the fully qualified domain name of the application server.

Step 7. Click the **Apply** button. Be sure to wait for the button to be grayed out.

Repeat steps 3 through 7 for each application server.

Part II: Configuring the Application to Use the Application Servers

- Step 1. Log into Tarantella as a Tarantella administrator.
- Step 2. Run Control Center.
- Step 3. Right click the **scocon** application object in the children box and select **Duplicate**. This will create a copy of the **scocon** object.
- Step 4. Change the name of the copy by setting the copy's **Object Name** and **Label** attributes to "Fancy scocon".
- Step 5. Change the **Application Server** attribute to **Use Hosts View**.
- Step 6. Click the **Apply** button. Be sure to wait for the button to be grayed out.
- Step 7. Right click the **Fancy scocon** object and select **Hosts**. The details pane now shows the hosts associated with this application.
- Step 8. Drag-and-drop the host objects that you created in Part I onto the details pane.

Part III: Using the Application

Now that you have configured the application (ie. **Fancy scocon**) to use the application servers:

- Step 1. Deploy the application to two Tarantella users
- Step 2. Log in simultaneously as both users
- Step 3. Launch **Fancy scocon** as each user
- Step 4. At the shell prompt, execute the **hostname** command.

This test should show the two users on different application servers. Alternatively, you can show who is on which application server by looking in **Sessions** in Control Center.

Make sure that the servers that will be used to create the array are functioning properly, ie: users can connect to each Tarantella server.

AV 7-5: Creating a Tarantella Array

Use this slide to illustrate the **tarantella array join** command.

AV 7-6: Querying a Tarantella Array

Use this slide to illustrate the **tarantella array query** command.

Use **tarantella array query --server *server*** to show the contents of the current load balancing table.

7.6 Answers to Exercise and Review Questions

This section contains the answers to exercises, review questions, and labs presented in this lesson.

Exercise answers

Please consult your instructor if you have any questions about the exercises in this lesson.

Review Question Answers

This section contains the answers to the review questions on page 7-15.

1. Some of the benefits of Tarantella load balancing are:
 - Increased Performance
 - Increased Robustness
 - Scalability
2. A host object represents an application server in the Tarantella datastore. Host objects allow you to balance applications across multiple application servers.

8

Windows Connectivity Pack

Instructor Guide

Instructor Guide

Lesson 8

Windows Connectivity Pack

Suggested lesson duration

This lesson should take approximately four hours to complete including the lab.

Pre-lesson classroom preparation

The system on which Windows Terminal Server is installed on should have at least 96MB of RAM. Each student should also have their own laptop or secondary Windows machine.

It is easiest if all of the machines in the classroom are capable of booting from the CD-ROM. If this is not possible, then three (four for Windows 2000) floppies are needed for each machine incapable of booting from CD-ROM.

Install Windows NT Server 4.0 Terminal Server Edition and Service Pack 5.

Instructor preparation

Although a Tarantella machine is not needed for this lesson, there needs to be at least one Tarantella server available at the end of the lesson (perhaps the instructor's machine). Do not convert all of the machines in the classroom to Windows Terminal Server or Windows 2000.

The lesson requires that the students know their machine name, IP address, subnet mask and DNS server. If their machines have an ISA networking card or a non-recognized networking card, then the parameters (IRQ, Base address, etc.) will need to be provided to the student.

Introduction

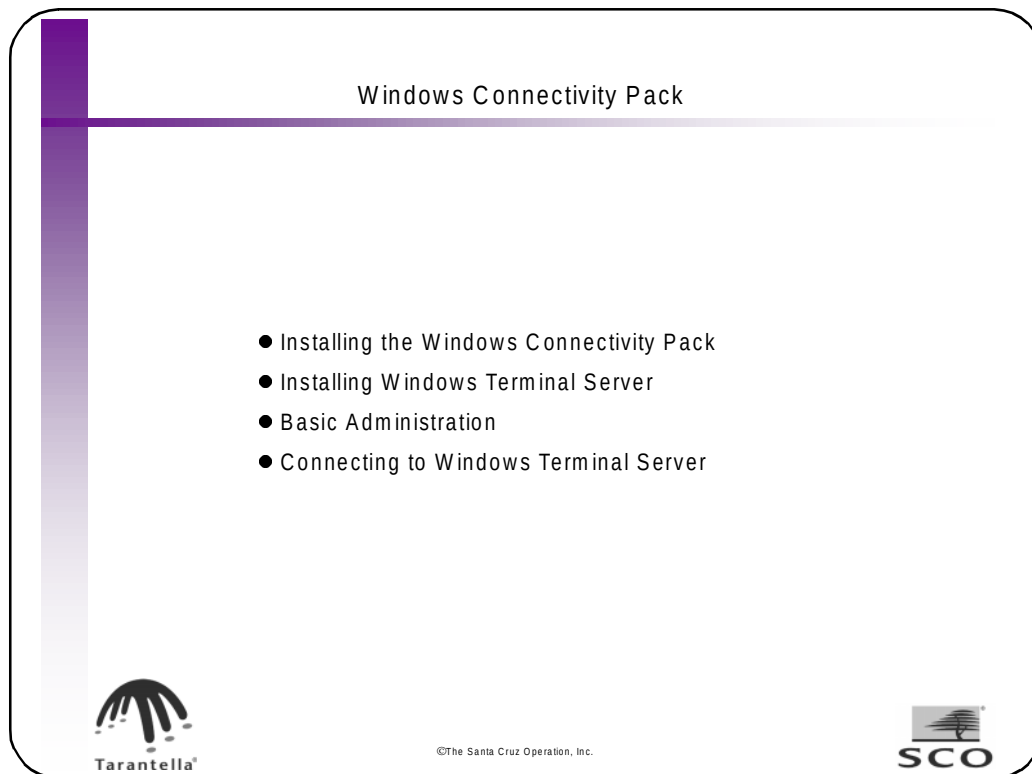
Many customers want Windows interconnectivity. The Windows Connectivity Pack is designed to provide this connectivity. To use the Windows Connectivity Pack effectively, it is important that Tarantella administrators at least become familiar with the Microsoft servers being used in the corporate workplace. This chapter explains installation, basic administration and connectivity of Windows Terminal Server and Windows 2000.

Objectives

By the end of this lesson, you will be able to:

- Install Windows Terminal Server Edition and Windows 2000
- Add applications, users, and perform other basic Terminal Server administration tasks
- Connect to a Windows Terminal Server from a Microsoft Terminal Server Client
- Configure Windows application object in Tarantella to enable users to launch Windows applications from Tarantella

AV 8-1



Topics

In order to meet these objectives, this lesson discusses:

- Installing the Windows Connectivity Pack — Discusses how to install the Windows Connectivity Pack onto a Tarantella server.
- Installing Windows Terminal Server — Discusses how to install Windows Terminal Server from CD-ROM (with or without floppies).
- Basic Administration — Discusses application installation and user creation. Points out which client connectivity programs are most useful to an administrator.
- Connecting to Windows Terminal Server — Shows how to install Microsoft Terminal Server Client and connecting to the Windows Terminal Server.

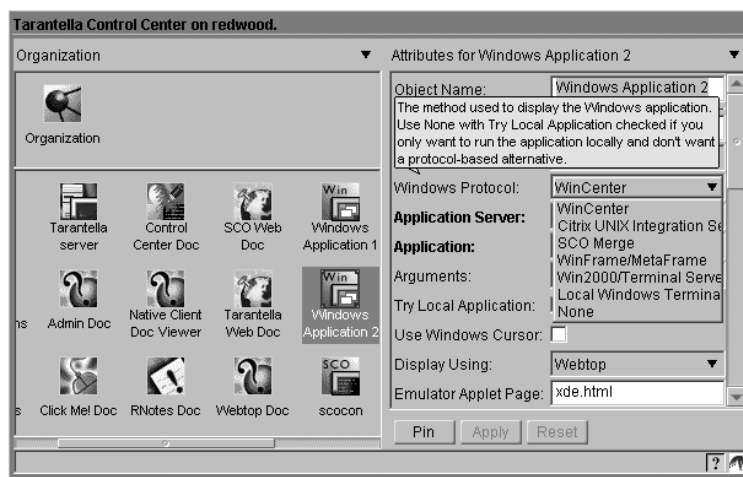


AV 8-1: Installing Tarantella

The first slide describes the overall topics covered in this lesson.

AV 8-2

Selecting a Windows Protocol



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Instructor Guide

AV 8-3

The "None" Protocol

Second Tier



AIP

First Tier

Application runs
locally on client

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8.1 Choosing a Windows Protocol

AV 8-2: Selecting a Windows Protocol

Use this slide to illustrate where, in Control Center, you select the protocol to use when running a Windows application. Point out the six different protocols.

One of the design goals of Tarantella is to broker Windows programs. In response to the ever-shifting Windows market place, Tarantella now has six different protocols to choose from when brokering a Windows application.

8.1.1 The “None” protocol

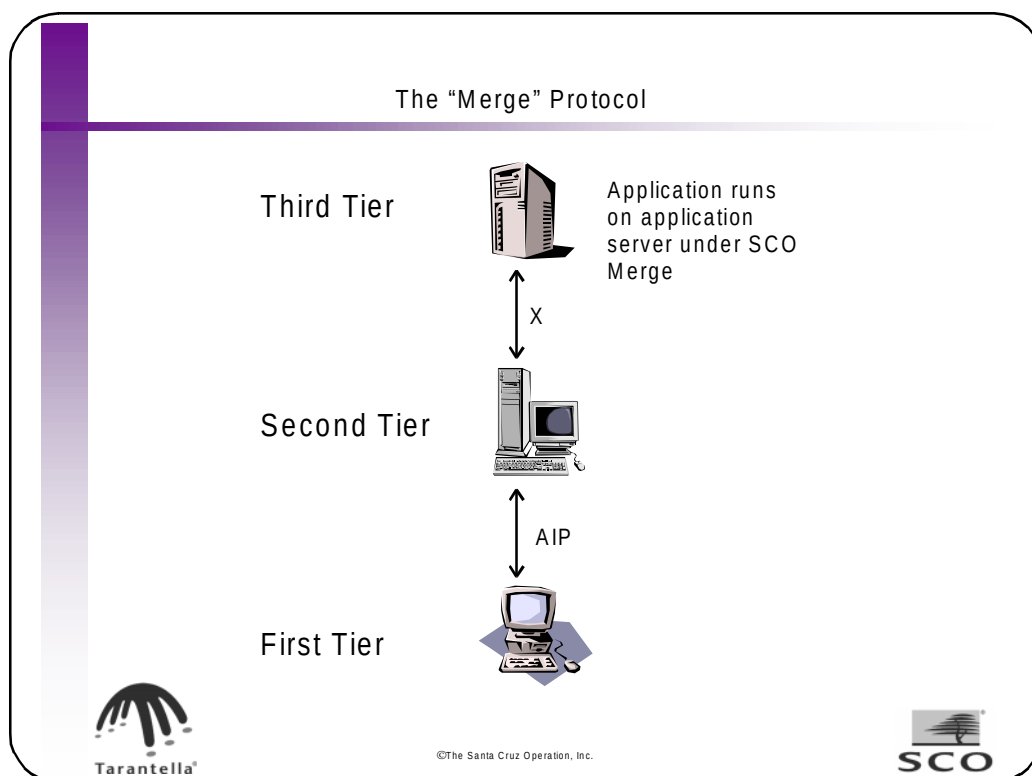
AV 8-3: The “None” Protocol

Use this slide to illustrate the “None” protocol.

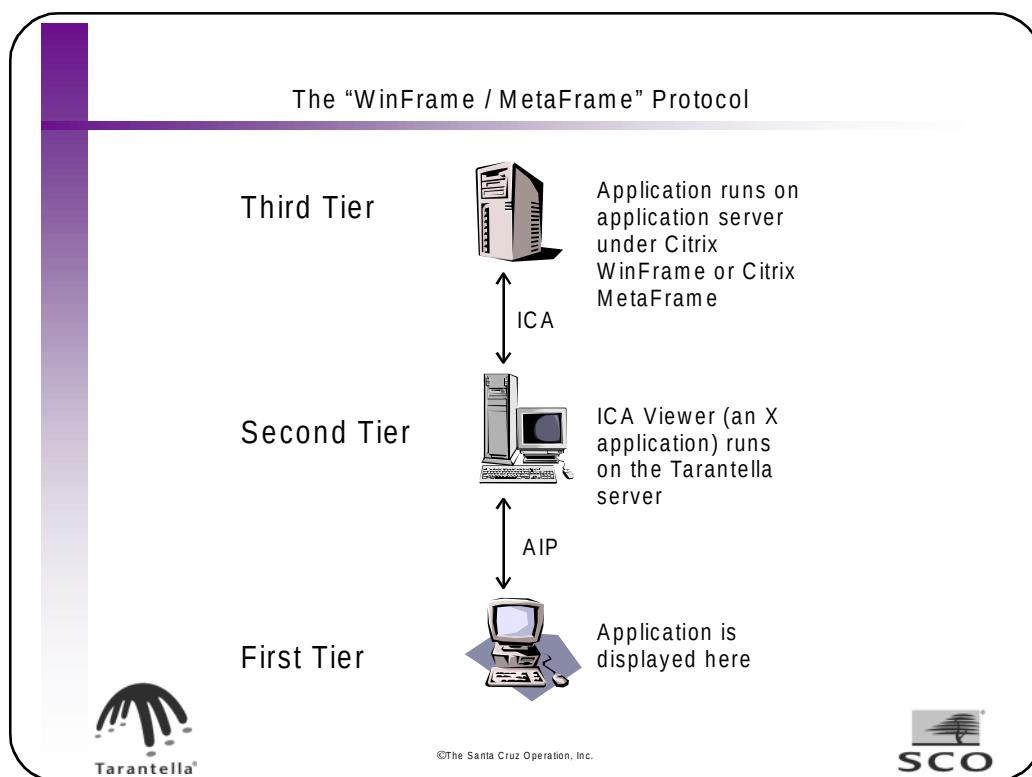
Use this protocol to run Windows programs that reside on the Windows client itself. When the user activates the application, the Tarantella server runs that application on the client. This is illustrated in AV 8-3 on page 8-8.

This protocol is used in conjunction with the “Try Local Application” checkbox on the windows application attributes form. In other words, if you chose “None” as your Windows protocol, you additionally need to check the “Try Local Application” checkbox.

AV 8-4



AV 8-5



8.1.2 The “SCO Merge” protocol

AV 8-4: The “SCO Merge” Protocol

Use this slide to illustrate the “SCO Merge” protocol.

Use this protocol to run an application on a UNIX server under SCO Merge.

8.1.3 The “WinFrame / MetaFrame” protocol

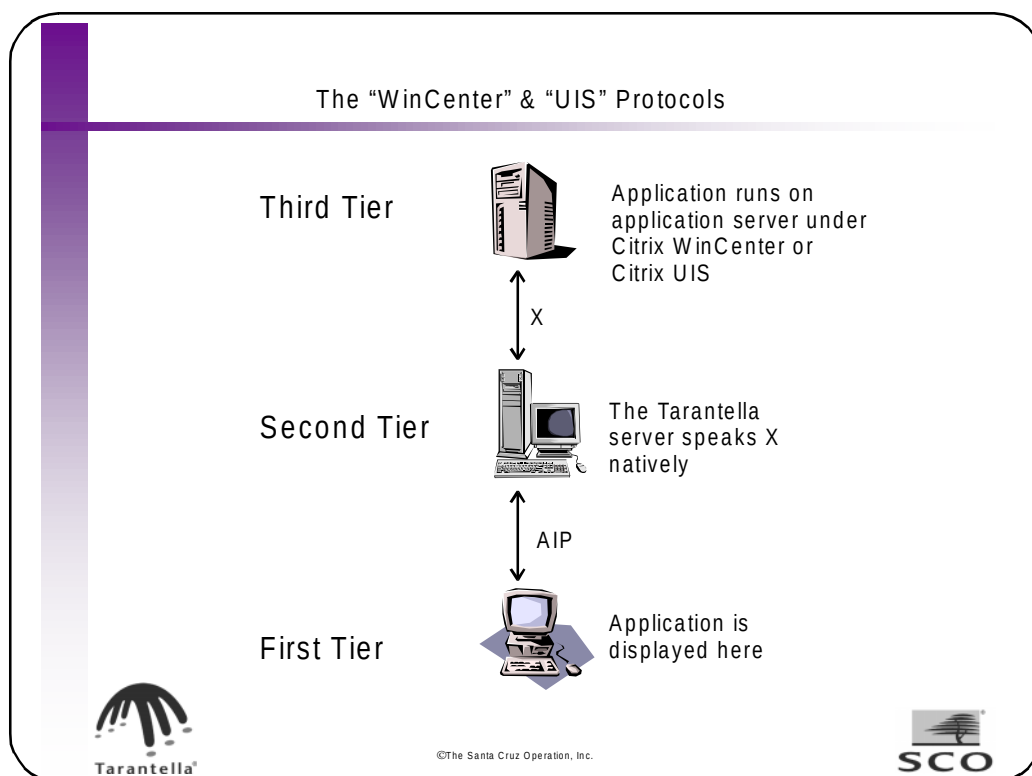
AV 8-5: The “WinFrame / MetaFrame” Protocol

Use this slide to illustrate the “WinFrame / MetaFrame” protocol.

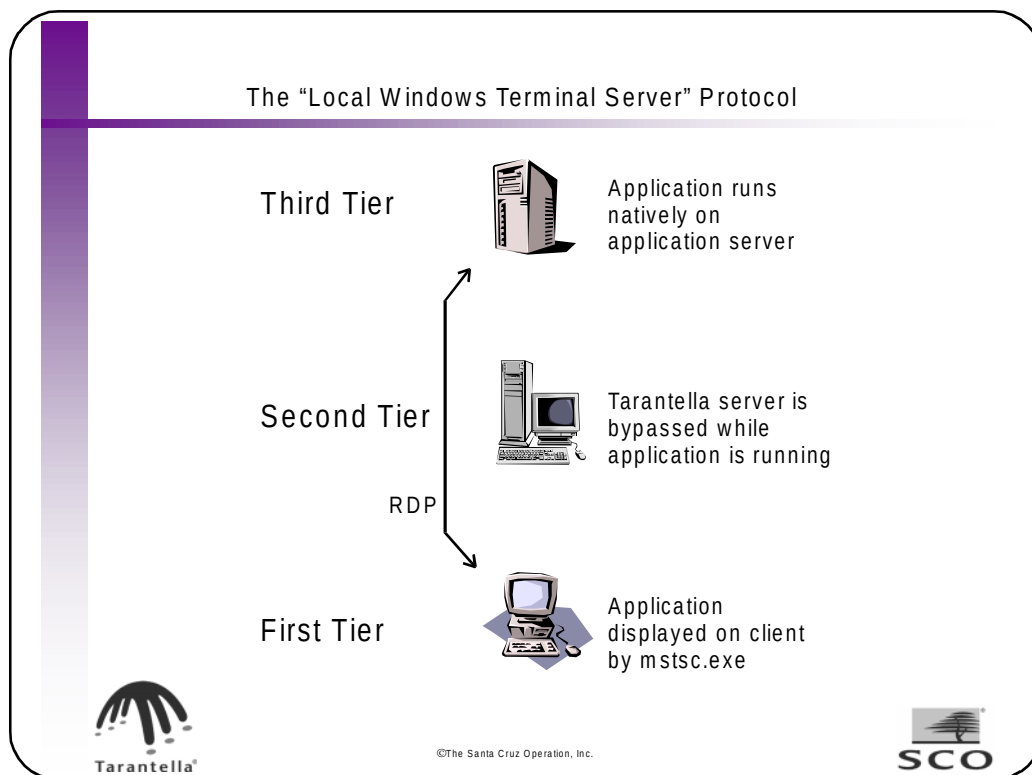
Use this protocol to run an application under Citrix WinFrame or MetaFrame.

Citrix WinFrame and Metaframe enable Windows applications running on an application server to be displayed on another machine running the *ICA viewer*. The ICA viewer is an X application. By running the ICA viewer on the Tarantella server, Tarantella is able to speak *ICA* to the application server and display the application on the Windows client via the AIP protocol.

AV 8-6



AV 8-7



8.1.4 The “WinCenter & UIS” protocol

AV 8-6: The “WinCenter / UIS” Protocol

Use this slide to illustrate the “WinCenter” and “UIS” protocols in Section 8.1.4 and Section 8.1.5 .

Use this protocol when the Windows application is being run under either of the following products:

- NCD WinCenter
- Citrix/NCD UNIX Integration Service (UIS)

Since WinCenter and UIS speak X, displaying them on the Windows client via Tarantella is just as easy as displaying any other X application.

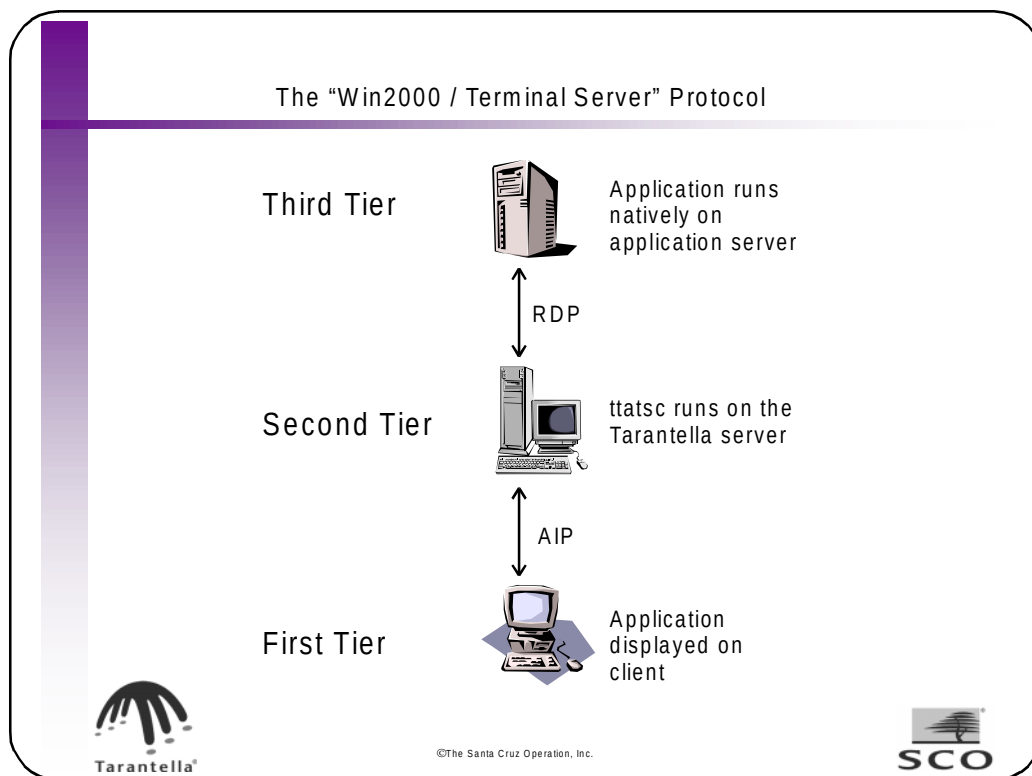
8.1.5 The “Local Windows Terminal Server” protocol

AV 8-7: The “Local Windows Terminal Server” Protocol

Use this slide to illustrate the “Local Windows Terminal Server” protocol.

Use this protocol when the Windows client already has *mstsc.exe* installed. This executable uses Microsoft’s Remote Desktop Protocol (RDP) to communicate directly to the application server. Tarantella only initiates the connection between the Windows client and the Windows server.

AV 8-8



Instructor Guide

8.1.6 The “Win2000/Terminal Server” protocol

AV 8-8: The “Win2000/ Terminal Server” Protocol

Use this slide to illustrate the “Win2000/ Terminal Server” protocol.

This protocol allows the first and third tiers to remain untouched. There is no need for the Microsoft Terminal Server Client or a third party product on the application server. This protocol is added to the Windows Protocols pull down menu in Control Center when the Windows Connectivity Pack is installed.

Make sure students understand how the “Win2000/Terminal Server” is added to the pull down menu.

Use the Windows Connectivity Pack when:

- Load balancing is required
- Better compression is required

Citrix sets up the parameters for compression when the session is initiated. Imagine you and 500 of your co-workers show up at 8:00 a.m. You start hitting the Windows server via Citrix all at once. Therefore your bandwidth is considered limited. This means you are considered a low bandwidth connection for the rest of the day.

- Encryption is required

WCP and TSP can work together. RDP supports low and medium (not high) encryption between the 2nd and 3rd tiers. The full TSP strength encryption can be used between the 1st and 2nd tiers.

The Windows Connectivity Pack installs a new binary on the Tarantella server called *ttatssc*. This program speaks RDP to the Windows server and communicates with the client via Tarantella’s AIP protocol.

A few limitations of the WCP:

- Tarantella’s third tier load balancing doesn’t take into account disconnected Windows Terminal Server sessions (it orphans them)
- Cursors are made monochrome and mapped onto available Java cursors
- You cannot use an X window manager

8.2 Installing the Windows Connectivity Pack

The installation and removal mechanisms in the Windows Connectivity Pack have been designed to be reliable and easy to use. The installation procedure is essentially same as the procedure detailed in Lesson 2: “Installing Tarantella.”

The Windows Connectivity Pack software runs on the following platforms:

- UnixWare 2.1.2+
- UnixWare 7+
- SCO OpenServer 5.0.2+
- Compaq Tru64 UNIX 4.0d+
- SPARC Solaris 2.5.1+
- IBM AIX 4.2+
- HP-UX 10.20+

8.2.1 Distribution media

The Windows Connectivity Pack software is distributed two ways:

Via the web

The Windows Connectivity Pack product (along with other Tarantella products) can be downloaded from <http://tarantella.sco.com>. Web-distribution is the primary method of distribution.

On CD-ROM

In special instances, SCO distributes the software on CD-ROM. This is not the primary method of distribution.

Table 7: Hints for Using CD-ROMs on SCO Platforms

SCO OpenServer 5	<code>mount -f HS -o ro,lower /dev/cd0 /mnt</code>
SCO UnixWare 7 SCO UnixWare 2.1	<code>/usr/sbin/mount -rF cdfs /dev/cdrom/cdrom1 /mnt</code>

8.2.2 Installation procedure

To install the Windows Connectivity Pack, follow this procedure:

Step 1. Log in as root.

There is no single-user mode requirement.

Step 2. Mount the CD-ROM.

Step 3. Run the following command:

```
sh wcp_file.shx
```

where *wcp_file.shx* is one of the following file names:

Table 8: Windows Connectivity Pack SHX File Names

Platform	SHX File name
SCO UnixWare® 7+	wcpi3un.shx
SCO UnixWare 2.1.2+	wcpi3un.shx
SCO OpenServer Release 5.0.2+	wcpi3sc.shx
HP-UX 10.20+	wcppahp.shx
IBM AIX 4.2+	twcprsai.shx
SPARC Solaris 2.5.1+	wcpspso.shx
Compaq Tru64 UNIX 4.0d+	wcpaxo1.shx

Step 4. Follow the on-screen prompts.

Now that the Windows Connectivity Pack is installed, “Windows 2000/Terminal Server” is the default windows protocol which creating Windows application objects in Control Center.

Exercise: Installing the Windows Connectivity Pack

Install the Windows Connectivity Pack on your Tarantella server. Once installed, verify that “Win2000 / Terminal Server” is the default windows protocol when Windows application objects are created.

8.2.3 Licensing issues

The Windows Connectivity Pack uses only one license per product (as implemented by Microsoft’s RDP protocol). You must still comply legally with Microsoft’s licensing policies. Furthermore, you need licenses for whatever applications you are running.

8.2.4 Scalability and performance

When using the Windows Connectivity Pack, there are no additional requirements on the Windows Terminal Server.

Up to 10Mb of graphics caching could occur on the Tarantella server.

This 10Mb cache limitation is no worse than the Windows Terminal Server client and is a feature of the RDP protocol.

CPU usage is minimal but proportional to the amount of incoming graphics.

There is latency due to the extra hop involved.

8.2.5 Installing applications

When you install an application under Windows Terminal Server or Windows 2000, Microsoft requires that you use the **Add/Remove Programs** utility to install the application. Failure to do so will result in the application only being available to the administrator.

In Windows 2000, you can often recover gracefully if you forget to use **Add/Remove Programs**. If, for instance, you unintentionally let the application install from the autorun script on the CD-ROM, you can go into **Add/Remove Programs**, select the application from the list of applications, and click the **Change** button. Note, however, that if the button says “Change / Remove”, clicking the button will *remove* the application.

The requirement to run **Add/Remove Programs** is imposed by Microsoft, not Tarantella. You have to use **Add/Remove Programs** with similar products such as Citrix.

8.2.6 Application compatibility scripts

Some applications such as Microsoft Office 97 provide an “application compatibility script” which must be run in order to make the application multi session ready. An example of running is given in Section 8.13 on page 8-47.

Not all applications provide an application compatibility script. Consult your application’s documentation to see whether an application compatibility script is required.

The requirement to run the application compatibility scripts is imposed by Microsoft, not Tarantella. You have to run the application compatibility scripts with similar products such as Citrix.

8.2.7 Deploying Windows applications under Tarantella

Creating application objects under Tarantella for Windows applications is similar to creating application objects for other application types. When using the Windows Compatibility Pack:

- Step 1. In Control Center, right-click on the background of the **children box**.
- Step 2. Select **New Object** ⇒ **Windows Application**.
- Step 3. Set the **Object Name**, **Label**, and **Icon** attributes as usual.
- Step 4. Set the **Windows Protocol** attribute to **Win2000/Terminal Server**.
- Step 5. Set the **Application Server** attribute to the fully qualified DNS-resolvable name of the Windows server.
- Step 6. Set the **Application** attribute to the pathname of the application (using “\” as the path delimiter).

Alternatively, set the **Application** attribute to “-” to have the application object display the Windows desktop.
- Step 7. Specify any arguments as needed in the **Arguments** attribute.
- Step 8. Check **Use Windows Cursor** .
- Step 9. Set the **Display Using** attribute as desired.
- Step 10. Click **Appl** .
- Step 11. Deploy this Windows application object.

8.3 Installing Windows Terminal Server and Windows 2000

The installation of Microsoft's NT-based products has not changed much in five years. The installation of Windows Terminal Server and Windows 2000 is very much like Windows NT 3.51. What has been added is device driver information and a few questions that are specific to a terminal server and licensing.

8.3.1 Windows Terminal Server and Windows 2000 requirements

Windows Terminal Server and Windows 2000 are multi user platforms. Hosting multiple users and running such a graphically intensive operating system puts a heavy load on the system memory. The server should have at least 96MB of RAM.

With only 64MB of RAM, system resources become overtaxed and various subsystems fail to run properly. This course can be finished with an under-configured machine, certain errors will arise but the bulk of the concepts and materials can be completed.

8.3.2 Distribution media and creating installation floppies

Both Windows Terminal Server and Windows 2000 come on a single bootable CD. If the machine is unable to boot from the CD-ROM, there are one of two likely problems occurring:

- The machine supports bootable CD-ROMs but is improperly configured.
- The machine does not support bootable CD-ROMs

If the machine supports booting from CD-ROM but is improperly configured, invoke the computer's CMOS setup utility to change the applicable BIOS setting(s). CMOS setup utilities vary from manufacturer to manufacturer. Consult your hardware manual for information about your computer's CMOS setup utility.

 Be prepared to assist students in setting up booting from CD-ROM if the machines support this feature.

If the machine does not support bootable CD-ROMs, you can create a set of floppies by following these steps:

Step 1. Insert the Windows Terminal Server or Windows 2000 CD-ROM into the drive on a Windows machine.

Step 2. Assuming your CD-ROM is D:, select **Start** ⇒ **Run**

Step 3. For Windows Terminal Server, type: `D:\i386\winnt.exe /ox`

For Windows 2000, type: `D:\bootdisk\makeboot a:`

This will bring up a DOS window and ask for high-density floppies. These floppies will become the install disks for the server.

8.3.3 Installing Windows 2000 Advanced Server.

The process for performing a complete installation of Windows 2000 Advanced Server is outlined in the lab in Section 8.9 on page 8-36.

If you are using Windows 2000 in the classroom, have the students perform the lab before proceeding. Make sure they do not perform the following labs:

- Installing Windows Terminal Server (Section 8.10 on page 8-40)
- Installing Service Pack 5 for Windows Terminal Server (Section 8.11 on page 8-44)
- Installing Internet Explorer 5.0.1 (Section 8.12 on page 8-46)

8.3.4 Installing Windows Terminal Server

The process for performing a complete installation of Windows Terminal Server is outlined in the lab in Section 8.10 on page 8-40.

In addition to performing the basic installation, you should also perform the steps outlined in the labs in Section 8.11 on page 8-44 and Section 8.12 on page 8-46. These labs install Service Pack 5 for Windows Terminal Server and Internet Explorer, respectively.

Have the students do the labs before proceeding.

8.4 Crucial information for Windows Terminal Server

This section details the information that you need to know as a Tarantella administrator when working with Windows Terminal Server.

8.4.1 Service Pack Installation

Service Pack 5 for Windows Terminal Server needs to be installed to enable Tarantella to work correctly with RDP. Instructions for installing Service Pack 5 are given in Section 8.11 on page 8-44.

If students installed Windows Terminal Server during the lab, have them perform the Service Pack installation lab in Section 8.11 on page 8-44.

8.4.2 Windows Terminal Server administration

While there are numerous utilities in Windows Terminal Server, only a few are relevant to RDP. All of these utilities can be found by selecting **Start** ⇒ **Programs** ⇒ **Administrative Tools (Common)**.

Terminal Server Administration

This is one of the more useful utilities to Tarantella administrators using Microsoft's RDP services. You can view what processes a user is running by clicking on the user. Information about the RDP protocol information can be determined with this utility.

Terminal Server Connection Configuration

The security section is probably the only section to be frequently used here. However, if there are several cards or protocols (RDP and ICA), this program can help segregate traffic.

User Manager for Domains

A very useful program and is discussed in the next section.

8.4.3 User creation

One of the most common tasks performed on a multi user machine is the creation of users. To create users in Windows Terminal Server:

- Step 1. Log in as **Administrator**.
- Step 2. Start the **User Manager for Domains**.
- Step 3. Choose **User** ⇒ **New User** .
- Step 4. Enter the name and password.
- Step 5. Choose **Config**.
- Step 6. Change “on a broken or timed-out connection” to **reset**.

Both Tarantella and Windows Terminal Server can handle session resume. Whereas Tarantella calls this “session resumability” Windows Terminal Server calls this “session disconnection.” To save resources on the Terminal Server, let Tarantella handle the resumability.

- Step 7. Click **Add**.
- Step 8. Click **Close**.

8.4.4 Disconnect, logoff and shutdown

There are several different ways to quit a Windows Terminal Server session.

- | | |
|------------|--|
| Disconnect | Start ⇒ Disconnect . This will log the user out but leave the programs running. When the user logs in again, they will be at the same spot and screen as when they disconnected. |
| Logoff | Start ⇒ Logoff . This will log the user off and close the users running applications. |
| Shutdown | This will shutdown the entire server. You can shutdown the system by selecting Start ⇒ Windows NT Security ⇒ Shutdown . |

Alternately, you can type **CTRL** **ALT** **DEL** at the console to display the Windows NT Security window and then select **Shutdown**.

8.5 Crucial information for Windows 2000

This section details the information that you need to know as a Tarantella administrator when working with Windows 2000.

8.5.1 Windows 2000 betas

The Windows 2000 betas are not supported by Tarantella.

8.5.2 RDP support

When using the “Win2000/Terminal Server” protocol (see Section 8.1.6 on page 8-15) in Tarantella, you must use a version of Windows 2000 which supports RDP (Remote Desktop Protocol). For instance, Windows 2000 Advanced Server supports RDP, whereas Windows 2000 Professional Edition does not.

8.5.3 Terminal Server 4.0 compatibility

During the installation of Windows 2000, the “Terminal Services Setup” screen prompts whether you want:

- “Permissions compatible with Windows 2000 Users” or
- “Permissions compatible with Terminal Server 4.0 Users”

You must select the latter.

8.5.4 Utilities for configuring Terminal Services

There are three utilities used for configuring Terminal Services under Windows 2000:

Terminal Services Client Creator	Used for creating setup floppies used to install the Microsoft Terminal Server Client (see Section 8.6 on page 8-31).
Terminal Services Configuration	Used to configure various settings for RDP connections. This utility is described in the follow sections.
Terminal Services Manager	Used to control RDP sessions. This utility enables the Windows administrator to send messages to RDP users, disconnect RDP users, reset RDP sessions, and perform other administrative tasks.

8.5.5 Disabling interactive login

Windows 2000 forces interactive login by default. Even if the password used by Tarantella for the authentication between the second- and third-tier servers is correct, Windows 2000 still prompts the user to enter a password. To turn off interactive login:

- Step 1. **Start ⇒ Programs ⇒ Administrative Tools ⇒ Terminal Services Configuration.**
- Step 2. Double-click **RDP-Tcp** under the Connection column.
- Step 3. Under the **Logon Settings** tab, check **Use client-provided logon information.**
- Step 4. Uncheck **Always Prompt for Password.**

Alternatively, you can leave Always Prompt for Password checked to allow users to log into different Windows 2000 accounts.

8.5.6 Installation of Terminal Services

During the installation of Windows 2000, you are given the opportunity to install Terminal Services. It is this component that installs RDP. If you fail to install Terminal Services during the installation of Windows 2000, you can install it after the installation:

- Step 1. Log in as **Administrator**.
- Step 2. Select **Start ⇒ Settings ⇒ Control Panel ⇒ Add/Remove Programs ⇒ Add/Remove Windows Components**.
- Step 3. Check **Terminal Services**.
- Step 4. Click **Next**.
- Step 5. Choose **Application server mode** on the “Terminal Services Setup” screen.
- Step 6. Click **Next**.
- Step 7. Click **Finish**.

8.5.7 Installation of Print Services for Unix

If you plan to use Tarantella’s follow-me printing feature from Windows 2000, you must install “Print Services for Unix”:

- Step 1. Log in as **Administrator**.
- Step 2. Select **Start ⇒ Settings ⇒ Control Panel ⇒ Add/Remove Programs ⇒ Add/Remove Windows Components**.
- Step 3. Highlight **Other Network File and Print Services**.
- Step 4. Click **Details...**
- Step 5. Check **Print Services for Unix**.
- Step 6. Click **OK**.
- Step 7. Click **Next**.
- Step 8. Click **Finish**.

8.5.8 Creating user accounts

To create user accounts in Windows 2000:

- Step 1. Log in as **Administrator**.
- Step 2. Select **Start** ⇒ **Programs** ⇒ **Administrative Tools** ⇒ **Computer Management**.
- Step 3. Double-click **Local Users and Groups**.
- Step 4. Highlight **Users**.
- Step 5. Select **Action** ⇒ **New User...**
- Step 6. Provide the information requested.
- Step 7. Uncheck **User must change password at next logon**.
- Step 8. Uncheck **Account is disabled**.
- Step 9. Click **Create**.

8.5.9 Using the Windows 2000 “guest” account

Windows 2000 automatically creates a “guest” account. However the guest account is not configured for use under RDP. To make the guest account available via RDP:

- Step 1. Log in as **Administrator**.
- Step 2. Select **Start** ⇒ **Programs** ⇒ **Administrative Tools** ⇒ **Terminal Services Configuration**.
- Step 3. Double-click **RDP-Tcp** under the Connection column.
- Step 4. Under the **Permissions** tab, click **Add...**
- Step 5. Highlight **Guest**.
- Step 6. Click **Add**.
- Step 7. Click **OK**.

8.5.10 Resetting connections

Windows 2000 has a feature much like Tarantella's session resumability feature. Under Windows 2000, sessions can be "disconnected." Tarantella cannot connect to disconnected sessions.

If you plan to have only Tarantella brokered connections to Windows 2000:

- Step 1. Log in as **Administrator**.
- Step 2. Select **Start** ⇒ **Programs** ⇒ **Administrative Tools** ⇒ **Terminal Services Configuration**.
- Step 3. Double-click **RDP-Tcp** under the Connection column.
- Step 4. Under the **Sessions** tab, check the *second* checkbox labeled **Override user settings**.
- Step 5. Check **End Session**.
- Step 6. Click **OK**.

Making the changes detailed above will prevent Windows 2000 from creating disconnected sessions.

If you plan to have non-Tarantella connections to Windows 2000 (eg. RDP client connections from *mstsc.exe*) you can allow Windows 2000 to disconnect sessions, but it is recommended that you specify a period of time after which to reset disconnected sessions:

- Step 1. Log in as **Administrator**.
- Step 2. Select **Start** ⇒ **Programs** ⇒ **Administrative Tools** ⇒ **Terminal Services Configuration**.
- Step 3. Double-click **RDP-Tcp** under the Connection column.
- Step 4. Under the **Sessions** tab, check the *first* checkbox labeled **Override user settings**.
- Step 5. Select a value for **End a disconnected session** (eg. 1 Hour). This will allow users a period of time to re-connect. More importantly, this will prevent Tarantella users from creating sessions that will never reconnect.
- Step 6. Under the **Sessions** tab, uncheck the *second* checkbox labeled **Override user settings**.
- Step 7. Check **End Session**.
- Step 8. Click **OK**.

8.6 Microsoft Terminal Server client

Make sure the students understand that *mstsc.exe* is not necessary when using Tarantella. This section is provided to allow students to see what users see when they use Microsoft's way of connecting to Windows Terminal Services.

The Microsoft Terminal Server Client (also known as *mstsc.exe*) is the program that Microsoft expects people to use to access systems running Windows Terminal Server Edition and Windows 2000. This utility isn't required when using Tarantella's "Win2000/Terminal Server" protocol (see Section 8.1.6 on page 8-15).

While *mstsc.exe* is not needed under Tarantella, it is useful to see *mstsc.exe* in action in order to understand the advantages of Tarantella.

To install *mstsc.exe* from the Windows Terminal Server CD-ROM:

- Step 1. Insert the Windows Terminal Server CD-ROM into your Windows client.

 If an installation window pops up, close the window. *Do not* install Windows Terminal Server on your Windows client.
- Step 2. **Start** ⇒ **Run** ⇒ **Browse** and browse to the CD-ROM to
 \CLIENTS\TSCLIENTS\WIN32\I386\DISK1\SETUP.EXE
- Step 3. Click the **Open** button.
- Step 4. Click the **OK** button.
- Step 5. Accept all of the defaults.

Make sure that the students understand that the procedure above is for administrators who have the Windows Terminal Server Edition CD-ROM. This CD-ROM is taken directly to the client machine.

The procedure following, on the other hand, is for administrators who have access to a Windows 2000 server with Terminal Services installed. This procedure is used to create two (or more) floppies on the Windows 2000 system and then taken to the client machine for installation.

Alternatively, you can create setup floppies under Windows 2000:

- Step 1. On a Windows 2000 server, select **Start** ⇒ **Programs** ⇒ **Administrative Tools** ⇒ **Terminal Services Client Creator**
- Step 2. Select “Terminal Services for 32-bit x86 windows”.
- Step 3. Specify which floppy drive to use.
- Step 4. Indicate if you want the floppies formatted.
- Step 5. Click the **OK** button.
- Step 6. The floppy creator tool prompts for you to insert the first floppy. Click the **OK** button.
- Step 7. The floppy creator tool prompts for you to insert the second floppy. Click the **OK** button.
- Step 8. Click the **OK** button when the tool reports that the floppies have been successfully created.
- Step 9. Insert the floppies into the floppy drive on the Windows client.
- Step 10. Click **Start** ⇒ **Run...**
- Step 11. Type “a:\setup.exe”.
- Step 12. Click the **Continue** button.
- Step 13. Enter your name and organization.
- Step 14. Click the **OK** button.
- Step 15. Click the **OK** button to confirm your information.
- Step 16. Click the **I Agree** button to accept the license agreement.
- Step 17. Click the “large button” to start the installation.
- Step 18. Click the **Continue** button.
- Step 19. Insert the second floppy when prompted and click the **OK** button.
- Step 20. Click the **OK** button.

Now that you have installed the Microsoft Terminal Server Client using either of the procedures outlined above, you can run the Terminal Server Client:

Step 1. **Start ⇒ Programs ⇒ Terminal Server Client ⇒ Terminal Server Client**

Step 2. In the dialog box, enter the IP Address or machine name of the Windows Terminal Server and Click the **Connect** button.

NOTE: Using the Microsoft Terminal Server Client there are only three resolutions possible. In contrast, Tarantella is not limited to these three resolutions.

Exercise: Install Microsoft Terminal Server Client and Attach to the Windows Terminal Server

Install the Microsoft Terminal Server Client and connect to a server running Windows Terminal Server Edition or Windows 2000 using various resolutions.

8.7 Lesson Summary

This lesson described how to install Windows Terminal Server and applications as well as basic administration and client connectivity. What has just been completed is generally what is done in a Microsoft-oriented corporate installation. All the clients would have Microsoft Terminal Server Clients installed and the servers would be Windows NT Terminal Server Edition. This methodology enhances the fat client paradigm since it requires specialized software on each Windows client.

8.8 Review questions

1. How many different windows protocols does Tarantella support (including None).

There are six Windows protocols: None, SCO Merge, WinFrame/MetaFrame, WinCenter/UIS, Local Windows Terminal Server and Win2000/Terminal Server.

2. If you have lost the floppies necessary for installing Windows Terminal Server or Windows 2000, how do you make new ones?

For Windows Terminal Server - D:\i386\winnt.exe /ox
For Windows2000 - D:\bootdisk\makeboot a:

3. How many different resolutions does the standard Microsoft Terminal Server Client have? Does Tarantella suffer from this same limitation?

Three. 640x480, 800x600, 1024x768. Tarantella can have any arbitrary resolution.

4. When logging into Windows NT Terminal Server Edition for the first time, what is the username to be used (assuming the machine is not a domain member)?

The name to use when first logging in is Administrator.

8.9 Lab: Installing Windows 2000

 This lab can be performed as an instructor led demo.

In this lab, you will install Windows 2000 Advanced Server onto your application server.

8.9.1 Overview

Your tasks in this lab are twofold:

- Create the boot floppies required by the installation (see Section 8.3.2 on page 8-21) or set up your machine to boot from CD-ROM
- Install Windows 2000

The instructor will point you to where you can obtain the necessary software.

8.9.2 Procedure

In this lab we assume that you are booting from CD-ROM. If this is not the case, see Section 8.3.2 on page 8-21 for information on creating installation floppies.

In addition, this lab makes the following assumptions:

- Your system requires no SCSI or RAID drivers
- You are using the entire disk for Windows 2000

To install Windows 2000 Advanced Server, follow this procedure:

- | | |
|---------|--|
| Step 1. | Insert the Windows 2000 Advanced Server CD-ROM (and boot floppy #1 if you are installing from floppy). |
| Step 2. | Boot the machine |
| Step 3. | The installation reports “Setup is inspecting your computer’s hardware configuration...”. |
| Step 4. | The installation prompts “Press  if you need to install a third party SCSI or RAID driver...”. Do not press  . |
| Step 5. | The installation reports “Setup is loading files” multiple times. |

- Step 6. The installation reports “Setup is starting Windows 2000”.
- Step 7. The installation reports “Setup program has detected that you are about to install Windows 2000”. Press **ENTER** to continue
- Step 8. The installation prompts “To set up Windows 2000 now, press ENTER.”. Press **ENTER** to continue.
- Step 9. The installation displays the Windows 2000 licensing agreement. Press **F8** to accept the license agreement.
- Step 10. The installation displays the fdisk table. If necessary, delete existing partitions using the **D** **ENTER** **L** key sequence.
- The non-intuitive **L** helps avoid problems should someone hold down the **D** key accidentally.
- Step 11. You are returned to the fdisk table. Type **C** to create a partition.
- Step 12. Enter size of partition in megabytes.
- Step 13. Type **ENTER**.
- Step 14. Type **ENTER** to install.
- Step 15. Select “Format this partition using the NTFS file system”.
- Step 16. Type **ENTER** to continue
- Step 17. This installation reports “Setup is copying files...”.
- Step 18. The installation reports “Please wait while setup initializes Windows 2000”.
- Step 19. Type **ENTER** restart the computer
- Step 20. The installation prompts “Please insert the Compact Disc labeled ‘Windows 2000 Server CD-ROM’ into your CD-ROM drive (E:) and the click OK.”
- Step 21. The installation reports “Welcome to the Windows 2000 Setup Wizard”.
- Step 22. Click **Next**.
- Step 23. The installation reports “Installing Devices”.
- Step 24. The installation displays the “Regional Settings” screen.

- Step 25. Click **Next**.
- Step 26. The installation displays the “Personalize Your Software” screen.
- Step 27. Enter your name and organization.
- Step 28. Click **Next**.
- Step 29. The installation displays the “Licensing Modes” screen. Choose “Per server” with 25 connections
- Step 30. Click **Next**.
- Step 31. The installation displays the “Computer Name and Administrator Password” screen.
- Step 32. Provide the information requested and click **Next**.
- Step 33. The installation displays the “Windows 2000 Components” screen.
- Step 34. Check “Terminal Services”.
- Step 35. Click **Next**.
- Step 36. The installation displays the “Date and Time Settings” screen.
- Step 37. Click **Next**.
- Step 38. The installation displays the “Terminal Services Setup” screen.
- Step 39. Select “Application server mode” (not “Remote administration mode”).
- Step 40. Click **Next**.
- Note that this screen says, “Use Add/Remove Programs in Control Panel to install programs for use in application server mode”. This is a requirement imposed by Microsoft.
- Step 41. The installation displays the “Terminal Services Setup” screen.
- Step 42. Select “Permissions compatible with Terminal Server 4.0 Users” (not “Permissions compatible with Windows 2000 Users”)
- Step 43. Click **Next**.
- Step 44. The installation reports “Installing Components”.

- Step 45. The installation reports “Performing Final Tasks”.
- Step 46. The installation reports “You have successfully completed Windows 2000 Setup.”
- Step 47. The installation reportst “If there is a CD in your drive, remove it.”
- Step 48. Click **Finish**.
-
- NOTE: Do not perform labs Section 8.11 on page 8-44 and Section 8.12 on page 8-46 on Windows 2000 servers.

8.10 Lab: Installing Windows Terminal Server Edition

In this lab, you will install Windows Terminal Server onto your application server.

8.10.1 Overview

Your tasks in this lab are two-fold:

- Create the boot floppies required by the installation (see Section 8.3.2 on page 8-21) or set up your machine to boot from CD-ROM
- Install Windows Terminal Server

The instructor will point you to where you can obtain the necessary software.

8.10.2 Procedure

In this lab we assume that you are booting from CD-ROM. If this is not the case, see Section 8.3.2 on page 8-21 for information on creating installation floppies.

To install Windows Terminal Server, follow this procedure:

- Step 1. Insert the Windows Terminal Server CD-ROM (and boot floppy #1 if you are installing from floppy).
- Step 2. Boot the machine.
- Step 3. If installing from floppies, follow the instructions for inserting the floppies.
- Step 4. Type  "To setup Windows Terminal Server Now".
- Step 5. Type  to accept the CD controller.
- Step 6. Type  to agree to the licensing agreement
- Step 7. Type  to accept the default list of hardware and software.

When setting up a production server, attention to the proper mouse and video card are necessary. For the class, the defaults should work.

 If the defaults are not correct for your classroom hardware, tell the students where they need to veer from the defaults.

Step 8. If there is a partition on the drive already (most likely the Unix partition) then delete it via the key sequence **D** **ENTER** **L**.

The non-intuitive **L** helps avoid problems should someone hold down the **D** key accidentally.

Step 9. Create a 2 Gigabyte partition by typing **C** **2** **0** **0** **0** **ENTER**.

GuruNotes In Windows Terminal Server, there is still a 2GB limit on a partition. There are ways around it, but for this lesson, it is best to avoid issues and just set up a 2GB partition.

Step 10. Type **ENTER** to install Windows Terminal Server on the partition.

Step 11. Select **NTFS** then type **ENTER**.

The drive will now start formatting.

With Windows Terminal Server, the default is FAT, but a FAT filesystem will not work for our purposes as it has limited security amongst other issues.

Step 12. Once the formatting is complete the you will be asked for the installation directory. Press **ENTER** to accept the default of **\WTSRV**.

Step 13. Press **ESC** to skip the secondary examination. This will save time in the classroom. The secondary examination should be performed on production servers.

The files will be copied from CD-ROM to the hard drive. This takes some time.

Step 14. After the copying is complete, eject the CD-ROM (and floppy) then press **ENTER** to reboot the machine.

The system will boot by itself. It will convert the filesystem from FAT to NTFS. It will reboot again by itself. The rest of the installation is done in graphical mode.

Yes, you heard right. We selected "NTFS" during the install, but Windows did "FAT" anyway. Go figure.

Step 15. Insert the CD-ROM when prompted and click **OK**.

Step 16. The installation will display an overview page of the next three steps. Click **Next** to start gathering the information.

Step 17. Enter a **Name** and an **Organization** and click **Next**. This is just an information field but can not be easily changed, so when installing in a production environment, choose wisely.

Step 18. Choose **PER SEAT**.

■ “Per Seat” is the easiest option for our purposes.

Step 19. Choose **5** (or thereabouts) for the quantity of clients. There is no immediate checking for licenses and this quantity will work for this lesson. In a production environment, the appropriate number of licenses need to be purchased.

Step 20. You instructor will tell you what to name your machine. Enter this name in the field labeled **Computer Name**.

Step 21. Click **Next** to accept the Stand Alone Server

Step 22. Use **root** as the password.

Step 23. Choose **NO** to avoid creating an Emergency Recovery floppy. This floppy is not needed here in the classroom, but in a production system, **YES** should be chosen.

Step 24. Click **Next** to accept the default software.

Step 25. Click **Next** to install Internet Explorer.

Step 26. The next step is the networking. Click **Next** to start the installation.

Step 27. Click **Next** to have the computer on the network.

Step 28. Click **Next** to *not* install Internet Information Server (Microsoft’s web server).

Step 29. Click **Start Search** to start the autodetection of the networking card.

If none are found then ask the instructor for assistance.

Step 30. Accept the defaults for the card, protocols and services.

If you are prompted for the network card’s parameter, ask the instructor for assistance.

■ In a production environment, uncheck the IPX/SPX protocol if it is not in use at the site. Having only one protocol cuts out any infrequent but difficult multi-protocol issues.

- Step 31. Choose **No** to *not* use DHCP.
- Step 32. Under the IP Address Tab, fill in the IP address, subnet mask and default gateway. This information will be provided by the instructor.
- Step 33. Under the DNS Tab, fill in the Domain Name and DNS server IP address. This information will be provided by the instructor.
- Step 34. Click **OK**.
- Step 35. A dialog box will pop up saying that WINS is not configured. Click **Yes** to continue on *without* setting up WINS.
- Step 36. Accept the default services, start the network and accept **Workgroup** as the workgroup name. Then click **Finish**
- Step 37. Choose the appropriate Time Zone, then click **Close**.
- Step 38. Accept the defaults for the display adapter and settings.
- The system will continue copying data.
- Step 39. Eject the CD when the copying is complete.
- Step 40. Click **Restart**.

Let the system boot up automatically. The system will automatically install Internet Explorer and then reboot again. It will then configure Internet Explorer which can take a while. When it is complete, the login screen will appear and the system is ready to use.

8.11 Lab: Installing Service Pack 5 for Windows Terminal Server

After installing Windows Terminal Server, you must install Service Pack 5.

NOTE: Perform this lab on Windows Terminal Server installations only. Do not perform this lab on a Windows 2000 server.

8.11.1 Overview

Your task is to install the Service Pack onto Windows Terminal Server. This software will be provided by your instructor.

8.11.2 Procedure

Step 1. Log onto the Windows Terminal Server system as **Administrator** with the password used earlier (**root**).

Uncheck the “Show Welcome Screen” and click **Close**.

Step 2. The instructor will provide you with the CD-ROM with the latest Service Pack. Insert this CD-ROM.

 The Service Pack is located on the Enterprise II CD-ROM.

Step 3. Choose **Start** ⇒ **Settings** ⇒ **Control Panel** ⇒ **Add/Remove Programs**

In the multi user NT environment, the installation of a program *must* be done via the **Add/Remove Programs** utility. Otherwise, the program will only be installed for the Administrator. Furthermore, certain registry settings may not be set properly.

Step 4. Click **Install**.

Step 5. Click **Browse** and browse to the \WTSSP5 folder on the CD-ROM.

Step 6. Choose *wtsi386* and click **Open**.

Step 7. Windows will insert the filename into the command line. Click **Next**.

Step 8. Click **Next** to install the service pack for all users

Step 9. Check the **Licensing Agreement**.

Step 10. *Uncheck* **Backup Files**. This is simply to save time in the classroom.

Step 11. Click **Install**.

Step 12. When the installation completes, click **Restart**.

8.12 Lab: Installing Internet Explorer 5.0.1

Windows Terminal Server provides an out of date version of Internet Explorer. In this lab you will upgrade Internet Explorer to 5.0.1 so that the web browser on the Windows Terminal Server can be used as a client to Tarantella.

NOTE: Perform this lab on Windows Terminal Server installations only. Do not perform this lab on a Windows 2000 server.

8.12.1 Overview

Your task is to install Internet Explorer 5.0.1 onto Windows Terminal Server. This software will be provided by your instructor.

8.12.2 Procedure

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|----------|---|
| Step 1. | Log onto the Windows Terminal Server system as Administrator . |
| Step 2. | The instructor will provide you with the CD-ROM with the latest Internet Explorer. Insert this CD-ROM. |
| Step 3. | Choose Start ⇒ Settings ⇒ Control Panel ⇒ Add/Remove Programs .

In the multi user NT environment, the installation of a program <i>must</i> be done via the Add/Remove Programs utility. Otherwise, the program will only be installed for the Administrator . Furthermore, certain registry settings may not be set properly unless you use the Add/Remove Programs utility. |
| Step 4. | Click Install . |
| Step 5. | Click Browse and browse to the <code>\ie5download</code> folder on the CD-ROM. |
| Step 6. | Choose <code>ie5setup</code> and click Open . |
| Step 7. | Windows will insert the filename into the command line. Choose Next . |
| Step 8. | Choose Next to Install For All Users . |
| Step 9. | Click Accept to accept the license agreement. |
| Step 10. | Choose Typical software installation. |
| Step 11. | When the copying completes, click Finish to restart the computer. |

8.13 Lab: Office97 Installation

In this lab, you will make Office97 available on the Windows Terminal Server.

8.13.1 Overview

Install Office97 on the Windows Terminal Server. Office 97 provides an application compatibility script which you are required by Microsoft to run.

Your instructor will provide you with the necessary software.

8.13.2 Procedure

- | | |
|----------|--|
| Step 1. | Log onto the system as Administrator . |
| Step 2. | Insert the Office97 CD-ROM. The autorun script on the CD-ROM will automatically launch an installation program. |
| Step 3. | Close the window <i>without</i> installing the application. Otherwise, only the Administrator will have access to the programs. |
| Step 4. | Choose Start ⇒ Settings ⇒ Control Panel ⇒ Add/Remove Programs
Windows should automatically find the <i>setup.exe</i> program on the CD-ROM. |
| Step 5. | Click Next to accept <i>setup.exe</i> . |
| Step 6. | Click Next to install for all users. |
| Step 7. | Click Continue . |
| Step 8. | Enter a <i>Name</i> and <i>Organization</i> and click OK to accept them. |
| Step 9. | Accept the ProductID and default installation folder. |
| Step 10. | Click Typical installation. |
| Step 11. | Click Continue to accept the defaults. |
| Step 12. | When everything is copied, click Finish . |
| Step 13. | Reboot the system. |

Step 14. Microsoft Office 97 provides an application compatibility script which you are required to run. When the system reboots, log in as **Administrator** and select **Start** ⇒ **Run** ⇒ **Browse**.

Step 15. Browse to **C:\WTSRV\Application Compatibility Scripts\Install** and run the *Office97.cmd* program.

This program is a simple script that fixes up issues that arise from the fact that multiple users will be using the Office programs.

You can view the comments in the *Office97.cmd* to see what it does and why.

Step 16. An edit box will pop up with a file that asks to be modified. Put in **W:** after the **Set RootDrive=**. The last line should read:

Set RootDrive=W

For reasons unknown, when converting this curriculum to PDF format the **W:** (double-u colon) above only shows up as **W**. The **Set RootDrive** command must be set to **W:**.

If students mistakenly type **W** instead of **W:**, you can fix up the registry by running *regedit*. Search for all occurrences of **W** and change them to **W:**. The usual precautions when editing the registry should be taken.

Alternatively you can edit the *office97.key* file created by the application compatibility script with wordpad, change the occurrences of **W** to **W:**, save the changes, then double click the *office97.key* file to apply the changes to the registry.

Step 17. Select **File** ⇒ **Save**.

Step 18. Select **File** ⇒ **Exit**.

The script will continue with the W: drive used as the users' drive.

Installing Office 2000 is similar. The only major difference is that Office 2000 does not provide (or require) an application compatibility script.

8.14 Lab: Creating an Application Object for Microsoft Solitaire

In this lab, you will create an application object to enable Tarantella users to access Microsoft Solitaire.

8.14.1 Overview

- Step 1. Log into Tarantella as **root**.
- Step 2. Create a Windows application object for Solitaire:
- Right-click the children box.
 - Select **New Object** ⇒ **Windows Application**.
 - Set the **Object Name** and **Label** attributes to “Solitaire”.
 - Set the **Application Server** attribute to the fully qualified domain name of the Windows application server.
 - Set the **Windows Protocol** attribute to **Win2000/Terminal Server**.
 - Set the **Application** attribute to *C:\WINNT\system32\sol.exe*.
 - Check **Use Windows Cursor**.
 - Click the **Apply** button. Be sure to wait till the button is grayed out.
- Step 3. Deploy the “Solitaire” application object that you created.
- Step 4. Refresh/reload the web browser.
- Step 5. Solitaire should now appear on the launch pad. Launch Solitaire.

8.15 Answers to Exercise and Review Questions

This section contains the answers to exercises, review questions, and labs presented in this lesson.

Exercise answers

Please consult your instructor if you have questions about the exercises in this lesson.

Review Question Answers

This section contains the answers to the review questions on page 8-35.

1. There are six Windows protocols: None, SCO Merge, WinFrame/MetaFrame, WinCenter/UIS, Local Windows Terminal Server and Win2000/Terminal Server
2. For Windows Terminal Server : `D:\i386\winnt.exe /ox`
For Windows2000: `D:\bootdisk\makeboot a:`
3. Three. 640x480, 800x600, 1024x768. Tarantella can have any arbitrary resolution.
4. The name to use when first logging in is **Administrator**.