

Novell OnDemand Services

Simplifies the Delivery of eProvisions by Linda Kennard

Over the past few years, several trade journals have suggested that “thin is in”—even for network computing. In fact, this catch phrase has become the cheer for the thin-client computing paradigm. Thin-client computing refers to a model in which workstations running little more than lightweight client software launch applications that are running on remote servers. In other words, in a thin-client computing model, servers house applications, and thin clients simply display those applications, forming a relationship reminiscent of that between mainframes and dummy terminals.

As a network administrator or IS manager, you probably know the professed point of thin-client computing: Thin-client computing is supposed to make your work life easier. The logic to this claim is convincing: If you enable workstations to launch applications that are stored on servers, you will likely reduce the amount of time (and money) required to maintain these workstations. After all, you won't need to upgrade workstation hardware as frequently, nor will you have to upgrade software on hundreds of workstations distributed throughout your enterprise. (For more information, see “Thin-Client Computing: Why Bother Losing Weight?” on p. 30.)

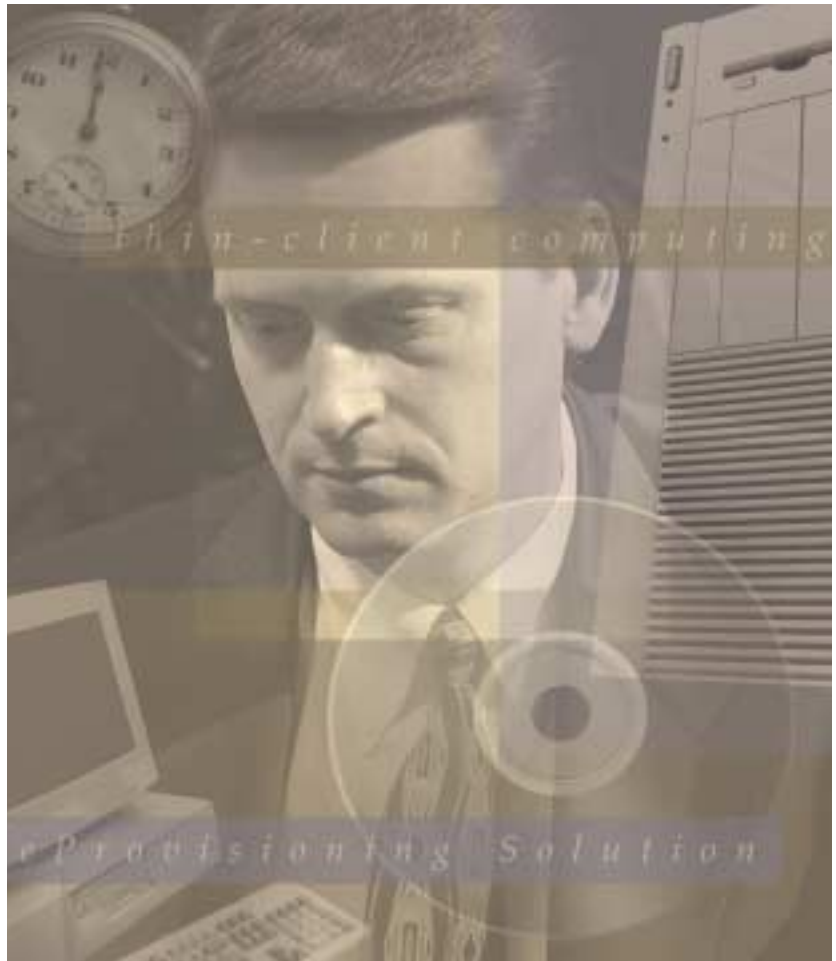
All of this may be true, but many thin-client computing environments today trade a reduction in workstation maintenance for an increase in network maintenance. For example, suppose you have deployed farms of servers running Microsoft Windows NT 4.0, Terminal Server Edition (TSE); Windows 2000 (with Terminal Services enabled); or Citrix MetaFrame (on top of Windows terminal services). Whatever your specific case, for users who require access to your terminal server farm, you have little choice but to manually create and maintain user accounts in either NT Domains or Active Directory (or maybe even both)—even though these users may already have accounts in Novell eDirectory.

In addition, before you can enjoy the convenience of thin-client computing, you have to install client software on users' workstations. If you are running Windows terminal servers, you have to install the Terminal Services Access Client (TSAC), which uses the Remote Display Protocol (RDP) to establish sessions between thin clients and terminal servers. If you are running Citrix MetaFrame, then you have to install the Independent Computing Architecture (ICA)

client. If you have users who need access to both your Windows terminal servers and your Citrix servers, then you have to equip these users' workstations with both the TSAC and ICA clients.

Thin-client computing is not supposed to be this hard. Deploying a model that eases the burden of maintaining workstations makes no sense if that same model increases the burden of maintaining the network.

To restore the logic underlying the thin-client computing model, Novell has developed Novell OnDemand Services 1.5, which is Net services software. Released on April 16, 2001, Novell OnDemand Services 1.5 integrates thin-client computing technology with directory technology, or more specifically, with eDirectory. By directory enabling thin-client computing



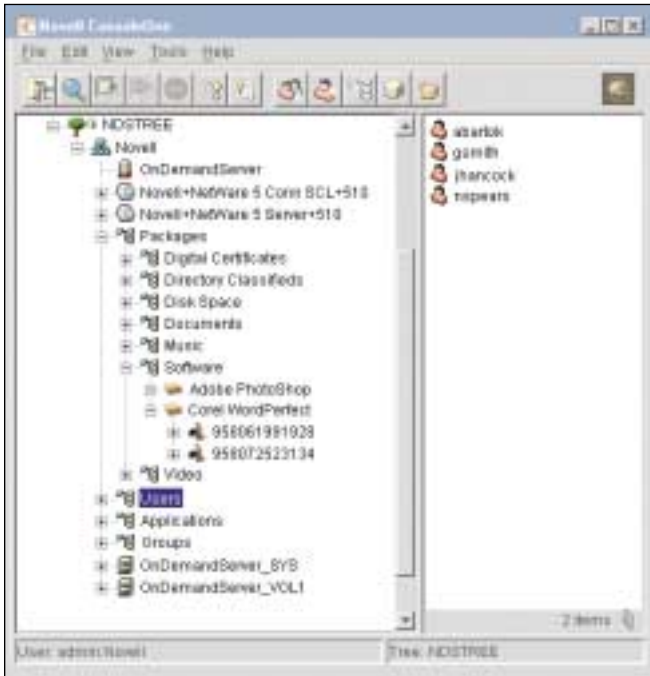


Figure 1. The Novell OnDemand Services 1.5 installation program extends the eDirectory schema and adds several new objects, some of which are created automatically and some of which you manually create.

environments, Novell OnDemand Services 1.5 ensures that these environments do what you expect them to do—that is, make your work life easier.

WHAT IS IT?

Novell OnDemand Services is an eProvisioning solution that enables you to easily deliver in real-time your company's eProvisions across thin-client, distributed, and web-computing environments. (For more information about eProvisioning solutions, see "eProvisioning: Get Your Business In Hand" on p. 6.) Sometimes called digital assets, eProvisions are the electronic goods and services that your company's employees, customers, and partners need to work for and with your company. When you install the Novell

OnDemand Services software on a NetWare 5.1 server with Support Pack 2, you can provide access to the following categories of eProvisions by default:

- Software (including web-based and Windows 32-bit applications)
- Documents
- Digital certificates
- Disk space
- Online classifieds
- Video files
- Music files

With Novell OnDemand Services 1.5, you create a web interface to make these eProvisions available—on demand—to your company's users. These users can access your eProvisions from anywhere they have access to an intranet or Internet connection and a standard web browser, specifically Netscape Navigator 4.0 or above or Microsoft Internet Explorer 4.5 or above. Furthermore, with Novell OnDemand Services 1.5, you can make all or some of these eProvisions available to all or some of your users for free or for a fee. (For more information about pricing and billing options in Novell OnDemand Services 1.5, see "Charge It!" on p. 32.)

To make your intranet, extranet, and the Internet work together as one Net, Novell OnDemand Services 1.5 uses eDirectory. eDirectory provides a central point from which you can manage not only your company's eProvisions, but also the NetWare and terminal servers from which users launch these eProvisions.

In addition, Novell OnDemand Services 1.5 uses eDirectory to store information about terminal servers. This information enables Novell OnDemand Services to automatically load-balance the eProvisions on your terminal servers without consuming unnecessary bandwidth. (See "DeFrame Watches DeLoad on De Server" on p. 36.) This load-balancing solution ensures that Windows 32-bit applications always launch from the server with the most available resources—giving users the performance they expect.

Through eDirectory, Novell OnDemand Services 1.5 also enables you to control access to eProvisions. As a result, some users can access and use eProvisions that other users don't even know exist.

In addition, Novell OnDemand Services 1.5 features a reporting tool that is accessible from almost anywhere, via an Internet connection and a standard web browser. This reporting tool gathers

THE SOLUTION

Using Novell OnDemand Services, IHS Energy delivers customized content to its clients. This content can be based on geographic region, country, or specific company. Users simply log in to the IHS Energy web site to download—and pay for—only the information they need. In addition to providing customized content for users, Novell OnDemand Services makes managing the IHS Energy network easier. Novell OnDemand Services provides load balancing capabilities and failover resources.

THE RESPONSE

"We've dearly benefited from Novell Net services software. Since implementation, our administration costs have decreased, while customer loyalty and satisfaction have dramatically increased. IHS Energy will undoubtedly remain the leading provider of oil and gas information services with Novell on our side," says Tim Teller, senior network engineer. ●

Novell Products in Action

Finding out about a new product is great, but you probably also want to know which companies are using the product and how they are using it. The following briefly explains how one company is using Novell OnDemand Services.

THE CLIENT

IHS Energy Group, a research provider to the energy industry

THE PROBLEM

Until recently, IHS Energy Group provided resource information to companies through a single CD-ROM that contained all of the company's research information. What their clients needed, however, was content customized to their individual needs and interests.

THE TOOLS

- Novell eDirectory
- Novell OnDemand Services

information from eDirectory and enables you to check the status of users' use of your eProvisions. Using this reporting tool, you can run reports based on user, group, or the category of eProvisions. (For more information, see "Reports On Demand" on p. 34.)

Oddly enough, what makes Novell OnDemand Services 1.5 really cool has less to do with what it does and more to do with what you don't do when you use it. For example, through its use of eDirectory, Novell OnDemand Services 1.5 enables you to distribute Windows 32-bit applications without creating user accounts—neither for your OnDemand server nor for your terminal servers. What is more, depending on how you choose to deliver applications, you may not have to manually install on users' workstations client software of any kind—not even the Novell Client 32. To see how one company used Novell OnDemand Services, see "Novell Products in Action."

THE MAIN ATTRACTION

According to Novell product manager Chris Wadsworth, this ease of access is what draws enterprises to Novell OnDemand Services 1.5. The primary attraction, says Wadsworth, is that Novell OnDemand Services 1.5 enables you to deliver Windows 32-bit applications to users equipped with no more than an Internet connection and a web browser.

Using Novell OnDemand Services, you can deliver Windows 32-bit applications by installing and configuring one or both of the following optional components:

- ZENworks for Desktops 3.2, which is included in the Novell OnDemand Services 1.5/ZENworks for Desktops 3 bundle
- DeFrame, which is included in the basic Novell OnDemand Services 1.5 package

What's the difference between using ZENworks for Desktops 3.2 and DeFrame? Basically, ZENworks for Desktops 3.2 is best suited for delivering applications over your intranet, and DeFrame is ideally suited for delivering applications over the Internet. Using the Novell OnDemand Services 1.5/ZENworks for Desktops 3 bundle is thus ideally suited for both purposes. (See "Fat and Thin From One Interface" on p. 33.)

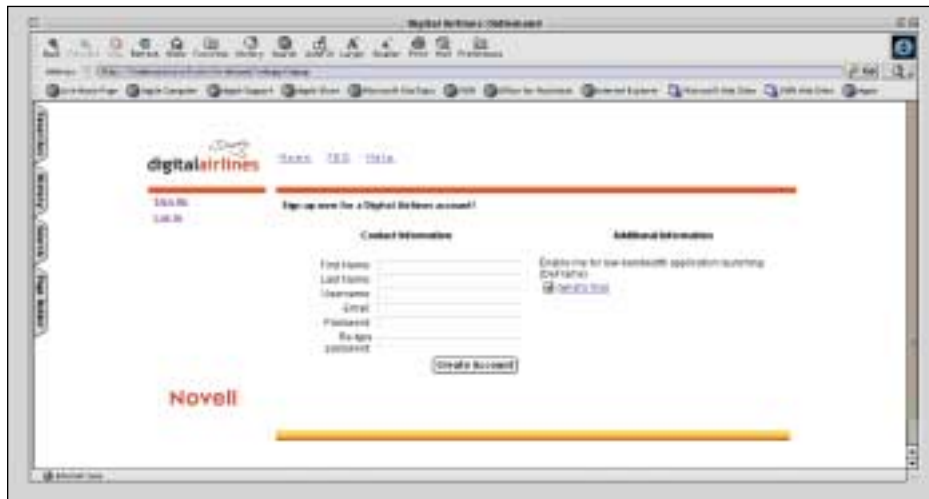


Figure 2. Digital Airlines is the fictitious company Novell invented to demonstrate Novell OnDemand Services 1.5. Novell customized the default OnDemand interface and functionality to create the Digital Airlines interface.

Delivering Applications Using ZENworks for Desktops 3.2

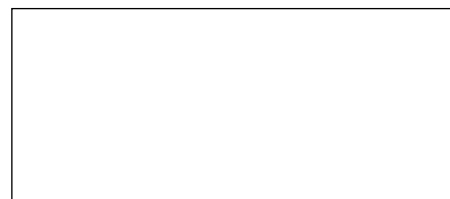
When a user requests applications you deliver using ZENworks for Desktops 3.2, the OnDemand server running ZENworks first accesses eDirectory. OnDemand checks eDirectory to ensure that the user has rights to this application and to determine on which NetWare server the application is running. Next, the OnDemand server pushes that application (in its entirety, generally speaking) to the local memory of the user's workstation, which must be running the Novell Client 32.

Delivering Applications Using DeFrame

Similarly, when a user requests applications you deliver using DeFrame, the OnDemand server running DeFrame accesses eDirectory. OnDemand checks eDirectory to ensure the user has rights to this application and to determine on which Windows or Citrix terminal server the application is running. Next, the OnDemand server establishes a session between the terminal server running the requested application and the user's workstation.

Unlike applications you deliver with ZENworks for Desktops, applications you deliver with DeFrame remain on the server at all times—only keystrokes, mouse clicks, and video bits cross the wire. As a result, the user's workstation does not need to be running the Novell Client 32. In fact, users can launch DeFrame applications without manually installing any client software.

Instead, DeFrame automatically loads either the TSAC or the ICA client, depending on whether the requested application is running on a Windows or Citrix terminal server, respectively. What is



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Thin-Client Computing: Why Bother Losing Weight?

If you're at all in tune with this world's weight-obsessed western culture, then you probably knew that "thin" clients were preferable to "fat" PCs from the first time you heard the terms. What's wrong with a few extra PC pounds, and what's so great about trimming the workstation's figurative fat?

One potential advantage of thin-client computing is that this model potentially saves your company money. After all, with a thin-client computing model, your company's network users don't necessarily need the powerful (a.k.a. costly) PCs they may currently be using. Instead, you can set up a thin-client server (such as Microsoft Windows NT 4.0, Terminal Server Edition) and buy less-expensive, thin-client hardware.

For example, instead of buying 300 IBM IntelliStation professional workstations at a cost of anywhere from U.S. \$1,487 to \$2,909 each, you could buy 300 IBM NetVista N2200 or N2800 thin clients at a cost of only U.S. \$579 to \$889 each. In this case, the thin-client option could save your company as much as U.S. \$699,000 in workstation hardware.

The cost savings is not the only benefit of using thin-client hardware. Because thin-client servers—not workstations—fully process network applications and data, thin clients don't require expansion slots or drives—hard, floppy, or CD-ROM. Consequently, thin clients have no risk of hard-disk-related problems. In

addition, users who have thin clients cannot endanger the network by loading viruses from floppy diskettes, installing software that causes conflicts and crashes, or copying company programs and proprietary data.

Of course, you don't have to buy thin-client hardware to deploy a thin-client computing model. You can use the PCs you already have. (Most likely, you'll use a mix of both PCs and thin clients.) In a thin-client computing environment, users can access even Windows 32-bit applications using only 286 and 386 DOS and Windows 3.x workstations, which points to another benefit of thin-client computing: In a thin-client computing environment, you won't need to upgrade workstation hardware as often as you do now because processing power and storage space is strictly a server-side issue.

The potential benefits of thin-client computing has not escaped the notice of network administrators and IS managers like you. In fact, three years ago, 35 percent of *Novell Connection's* readers had already deployed thin clients, more commonly known then as (and still sometimes called) *network computers*. That was 1999, the year during which IDC claims the sale of thin clients nearly doubled, climbing from 368,497 units sold in 1998 to 699,895 sold in 1999. Since then, the thin-client market has steadily grown, and IDC expects this growth to continue—anticipating shipments of some 9.5 million thin-client units by the end of 2004. (For more information, visit www.idc.com:8080/itforecaster/itf2000-04-04.htm.)

equally important (and exciting) is that the user does not need an account on the terminal server. DeFrame automatically creates a temporary account on the terminal server running the requested application. This account lasts only for the duration of a session.

DEPLOYMENT BASICS

Naturally, the specifics of how you set up a Novell OnDemand Services server vary depending on several criteria, including what types of eProvisions you plan to make available, whether or not you plan to use DeFrame, and how you expect your customers to pay for eProvisions. However, the minimum basic requirements for setting up a Novell OnDemand Services 1.5 server remain roughly the same and include these preliminary steps:

1. Prepare the server for Novell OnDemand Services by installing the requisite software, including the following:
 - NetWare 5.1 with Support Pack 2 or above.
 - eDirectory 8.5 and ConsoleOne (available on the Novell OnDemand Services 1.5 CD).
 - Novell Java Virtual Machine (JVM) 1.2.2 for NetWare. (You can down-

load this product from www.novell.com/download.)

- IBM WebSphere Application Server 3.5, Standard Edition for NetWare 5.1. (You can download this product from www.novell.com/download.)

Note. As mentioned, if you plan to deliver Windows 32-bit applications, you also need to install ZENworks for Desktops 3.2, DeFrame, or both.

2. If you plan to use the DeFrame component, you will also need to complete the following steps:
 - Verify that your terminal servers are running any one of the following supported software versions: Windows NT 4.0, Terminal Services Edition with Service Pack 6; Windows 2000 (preferred) with Terminal Services enabled; or Citrix MetaFrame 1.8 with Service Pack 1.
 - Install the Novell Client 32 (version 4.8) on each terminal server.
3. Decide what eProvisions you plan to offer, and then install the eProvision content somewhere on your company's network. For example, if you plan to deliver Corel WordPerfect, you need to install that application on the network.

4. After you have prepared the server and organized the eProvisions you will offer, you need to install Novell OnDemand Services 1.5. To do so, you run SETUP.EXE (which is on the Novell OnDemand Services 1.5 CD) from a Windows 2000, NT, 98, or 95 workstation that is running the Novell Client 32. Then, follow the prompts provided by the installation program's two wizards:

- The Install Wizard
- The System Setup Wizard

The Install Wizard copies the Novell OnDemand Services 1.5 files to the OnDemand server. The System Setup Wizard extends the eDirectory schema and adds several new objects, some of which the wizard automatically creates and some of which you must manually create. (See Figure 1 on p. 28.)

During installation, you select which of the default eProvision categories you plan to make available on the OnDemand server. The installation program automatically creates a Packages container and then creates subcontainers for each eProvision category you plan to offer. For example, if you plan to make available only software and

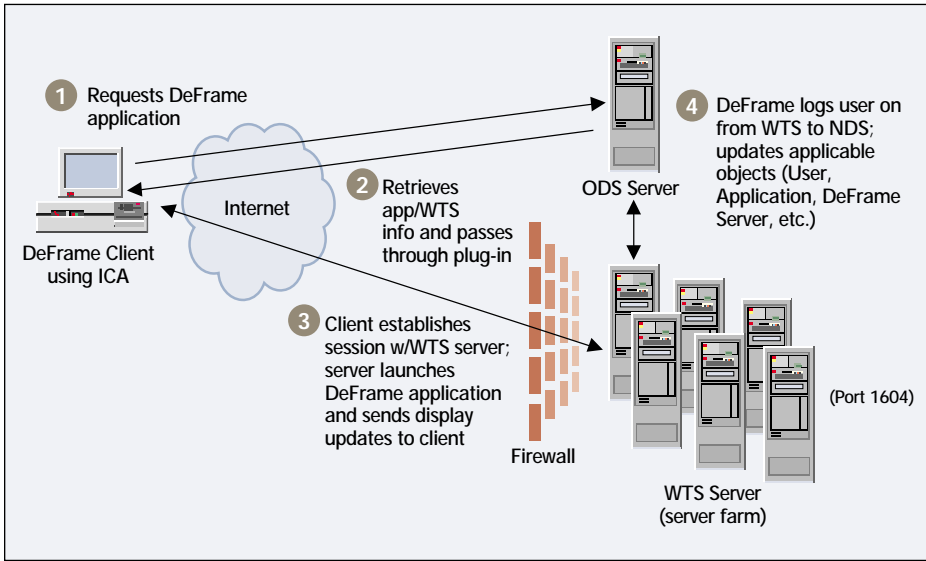


Figure 3. Novell OnDemand Services 1.5 automatically loads the appropriate software so users can access DeFrame applications running on either Microsoft Windows terminal servers or Citrix MetaFrame servers.

documents on your OnDemand server, the installation program creates Software and Documents containers within the Packages container.

Within these Software and Documents containers, you create Commerce Package objects, which represent the specific eProvisions you plan to offer. For example, in your Software container, you may create a Commerce Package object for Corel WordPerfect and for Adobe PhotoShop.

For each Commerce Package object you create, the installation program prompts you to enter information about the eProvision this object represents. For example, for the Commerce Package object you create for a specific application, you must provide at least the following information:

- The Commerce Package object name, as you want it to appear in eDirectory

Charge It!

Novell OnDemand Services 1.5 enables you to deliver your eProvisions for free or for a fee. If you plan to charge for the use of some or all of your eProvisions, Novell OnDemand Services 1.5 gives you several pricing schemes from which to choose. For example, for any type of eProvision you offer via Novell OnDemand Services 1.5—whether it's digital certificates, disk space, software, documents, music files, or video files—you can set the Purchase pricing option. This option requires users to pay a one-time fee for a package, after which they can access and use the service anytime.

For applications that you are delivering using ZENworks for Desktops 3.2 and DeFrame, you can configure Novell OnDemand Services 1.5 to track usage. In this case, you have four other pricing options in addition to the Purchase option:

- **Per Usage.** Users pay a fee each time they use a package.
- **Clock Time.** Users pay for a set amount of time before using the package. You can choose to have this set time start either when users pay for the package or when they first access the package. In any case, from the start time, the clock runs continuously and expires after the set amount of time.
- **Actual Time.** As with the clock option, users pay for a set amount of time before using the package, and the time starts either upon purchase or from the first time users access the package. However, Novell OnDemand Services 1.5 records only the actual time users spend using the package. Thus, if user Linda purchases five hours, she can use one hour today, three hours tomorrow, and one hour next week.
- **Pay-As-You-Go.** Users pay by the minute for using the package. Novell OnDemand Services 1.5 creates a usage record and does not tally the total amount until a user ends a session.

You can combine several of these options. For example, you can set both the Purchase and Pay-As-You-Go options, perhaps requir-

ing users to pay U.S. \$5 up front for use of a particular DeFrame application and an additional U.S. 10 cents per minute.

If you charge some or all users for their use of the eProvisions you're offering, you will need to arrange a method by which you can charge and users can pay. You have two billing options:

- For pricing schemes based on a one-time fee (that is, Purchase, Clock Time, and Actual Time), you can charge users immediately and enable them to pay by credit card online.
- You can bill users later and enable them to pay using whatever method your billing system accepts.

To enable users to pay by credit card, your company first needs to set up with its bank a merchant account to receive the credit card payments. Your company also needs to sign up with a credit card service, such as Authorize.Net (www.authorizenet.com), the service with which Novell OnDemand Services 1.5 is integrated. Authorize.Net is a global payment-processing service that enables you to authorize, settle, and manage online credit card transactions. Assuming you sign up for an account, Authorize.Net will manage and process credit card transactions.

If you prefer to bill users, you need to integrate your billing system with Novell OnDemand Services 1.5 using Novell's DirXML or a similar application. After you have integrated these two systems, Novell OnDemand Services 1.5 can send any necessary information to your billing system. For example, Novell OnDemand Services 1.5 extends the eDirectory schema to include an Account ID under the User object's Cost tab. This ID property can be used to match a Novell OnDemand Services user's account with the same user's account in the third-party billing system.

You can set up the pricing options and an account with Authorize.Net entirely on your own. However, if you choose to use a different credit card service or to integrate Novell OnDemand Services 1.5 with a third-party billing system, you will probably need to elicit Novell Consulting's help. ●

and as you want it to appear to your OnDemand users

- The type of application this object represents—that is, one of the following:
 - A web application
 - A Windows application you will distribute using ZENworks for Desktops 3.2
 - A Windows application you will distribute using DeFrame
- The eDirectory Application object that you want to associate with this Commerce Package object
- Whether or not you will enable this package to be purchased

WHAT DO YOU WANT IT TO BE?

After you have set up Novell OnDemand Services 1.5 to this point, you can test the system. However, you may still want to customize Novell OnDemand Services 1.5 to suit your company's specific needs. You can customize the look and feel of Novell OnDemand Services software as well as some of its default functionality.

For example, Novell created Digital Airlines, a fictitious company, to demonstrate Novell OnDemand Services 1.5. (See Figure 2 on p. 29.) To create this interface, Novell modified the default interface that loads when you install the red-box solution of Novell OnDemand Services 1.5. You can see exactly how Novell modified the

default interface when you visit the online demonstration of Novell OnDemand Services. (You can find this online demonstration at <http://ondemand.novell.com>.)

In addition to customizing the interface, Novell customized some of the functionality on the Digital Airlines pages. For example, on the default page, there is an Activate button next to each software package. When users click this button, they see a dialog box that asks whether or not they want to purchase the service they selected. Users click Yes to activate the service. On the comparable Digital Airlines page, there is no such button. Instead, users simply click the name of the service they want to launch.

THE RED BOX

The red-box Novell OnDemand Services 1.5 solution, which ships with the default interface, was the only version of the OnDemand solution shipping at the time this article was written. To customize this interface, you need a working knowledge of Java and HTML to modify the default pages, which were developed using Java Server Pages (JSPs), JavaScript, and an embedded HTML component.

You can determine whether or not you (or any of your coworkers) have a sufficient understanding of Java and HTML to customize its pages by opening the `SYS://ONDEMAND/WEBAPP/WEB` folder located on your OnDemand

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Fat and Thin From One Interface

If your organization is like most organizations, it probably isn't planning to put its entire network on a diet. In other words, you probably have both fat and thin clients, which is precisely why you need the Novell OnDemand Services 1.5/ZENworks for Desktops 3 bundle. (Fat clients, unlike thin ones, store applications on their hard drives.)

The Novell OnDemand Services 1.5/ZENworks for Desktops 3 bundle provides a complete and compelling solution for managing network clients, enabling you to manage fat and thin clients alike from a single interface: the ConsoleOne interface to eDirectory. With this bundle of products, you can use

ConsoleOne to define one set of rules in eDirectory that you can then apply to both fat and thin clients.

End-users benefit from this product combination for several reasons. For one thing, this bundle offers users a single interface—your OnDemand Server web site—from which users can launch applications managed by ZENworks servers or stored on terminal servers. This ability to launch either ZENworks or terminal server applications provides failover capabilities: If an application managed by ZENworks fails to install to a user's workstation, OnDemand Services instead can launch the same application from a terminal server. These failover capabilities will be enhanced in the next release of ZENworks for Desktops. ●

server. Within this folder, you will find several JSP and text files. You customize the interface and functionality of your OnDemand server by modifying these files. (For more information, see “Novell OnDemand Services: Architecture and Customization,” *Novell AppNotes*, Jan. 2001. You can download this article from <http://developer.novell.com/research/appnotes/2001/january/01/a010101.htm>.)

THE PORTAL GADGET

You may soon have the option to purchase an OnDemand Services Portal Gadget. This gadget is due to be released in November. This gadget will enable you to integrate OnDemand Services with your corporate portal, assuming you have created such a portal using Novell Portal Services.

Novell Portal Services is portal framework software that enables you to create a custom portal to meet your company's unique needs. With Novell Portal Services, users can log in to the portal and,

depending on the portal gadgets you have deployed, access their e-mail, the corporate white pages, corporate and worldwide news, and file services—to name only a few of the possibilities.

By integrating Novell OnDemand Services with Novell Portal Services, you enable portal users to access whatever applications you deliver via your OnDemand server. By entering their eDirectory username and password once, users can access everything they can access from the office from anywhere they have an Internet connection.

As you can with the Novell OnDemand Services red-box solution, you can customize the OnDemand Services Portal Gadget. To do so, you need to modify the gadget. To modify the gadget, you need a working knowledge of Java, eXtensible Markup Language (XML), and eXtensible Stylesheet Language Transformations (XSLT).

For more information about Novell Portal Services, see “Novell Portal Servi-

ces: A Better Way To Build a Desktop,” *Novell Connection*, December 2000, pp. 22–32; and “Novell Portal Services: The Tools You Need To Build a Better Desktop,” *Novell Connection*, January 2001, pp. 18–31. You can download these articles from www.ncmag.com/past.

CREATING USER ACCOUNTS—FORGET ABOUT IT!

Whether or not you purchase the Novell OnDemand Services 1.5 red-box solution or Portal Gadget, one thing is certain: You do not have to manually create user accounts to enable users to access your OnDemand server.

For example, suppose you purchase the red-box Novell OnDemand Services 1.5 solution. To access the OnDemand server, users enter the URL for this server, which by default is <http://hostname/ondemand>. (The hostname is the Domain Naming System (DNS) name or IP address of the server running Novell OnDemand Services 1.5.) At this point,

Reports On Demand

Novell OnDemand Services includes a web-based reporting tool that gathers information from Novell eDirectory regarding the use of the eProvisions you're offering. You can access this reporting tool from anywhere you have an Internet connection and access to a standard web browser.

To access the reporting tool, enter <https://hostname/ondemand/report>, where hostname is the Domain Naming System (DNS) name or IP address of your OnDemand server. At the prompt, you then enter your eDirectory username and password. By default, no users are allowed access to the reporting tool. To enable access to users who should be authorized to use the reporting tool, you must add these users to the following file: SYS:SYSTEMWEBCONFIG.PROPERTIES file. Users whose eDirectory names are added to this list can authenticate to eDirectory and use the reporting tool.

The reporting tool enables you to generate three reports:

- User reports
- Group reports
- Package reports

User reports enable you to view information about an individual user or all users in an eDirectory container. From within the date range you specify, the reporting tool culls information regarding the purchases the selected users have made. The reporting tool gathers information such as the purchase ID, package name, package cost, and purchase date.

Group reports enable you to view information about the users within a specified eDirectory group or within all of the groups in a specified container. As with the User reports, Group reports

enable you to specify a date range, after which the report tool gathers information about users' use or purchase of OnDemand packages.

The Package report enables you to view information about the following:

- A specific Commerce Package object, such as the object you may create for Microsoft Word
- All Commerce Package objects within a specified Service container, such as the Software Service container
- All packages within the Package container—that is, all of the Commerce Package objects you have created in each of the Service containers
- Only the packages you check from a list of available packages

For Package reports, the reporting tool gathers the same information as it gathers for Group and User reports. In addition, a Package report may display answers to the following questions regarding users' purchase items:

- Is this purchased item currently in use?
- Has this purchase already been billed?
- Is this purchase expired (when you have selected an Actual Time or Clock pricing scheme, for example)?
- Is this purchase item okay to delete?

Novell OnDemand Services 1.5 can automatically answer these questions, or you can override the system by manually answering the questions. For example, you may want to override the system by marking a purchase item as okay to delete. Novell OnDemand Services 1.5 automatically deletes any item marked as okay to delete. ●

the user is prompted to either Sign In or Log On.

When a user clicks the option to Sign In, Novell OnDemand Services returns a self-registration form that prompts the user to enter the username and password he or she will use to access the OnDemand server. When the user submits this form, Novell OnDemand Services automatically creates an eDirectory User object for this user in the OnDemand Services Users container.

Are you getting this? For every new employee, customer, partner—every anybody—who requires an account with Novell OnDemand Services 1.5, you need to do nothing to create that account. Novell OnDemand Services automatically creates eDirectory User objects in the OnDemand Services container and, by doing so, enables users to access your OnDemand server.

Of course, you and your users already have eDirectory User objects, but those objects probably aren't located in the OnDemand Services Users container. How do you enable users who have existing eDirectory User objects (that are not located in the OnDemand Services Users container) to access Novell OnDemand Services 1.5? You have the following three options:

- Do nothing.
- Do a little.
- Do a little more.

Do Nothing

To do nothing, you do nothing. (Imagine that.) Users with or without existing eDirectory User objects simply Sign In to the OnDemand server and complete the self-registration form. Novell OnDemand Services 1.5 then creates a new User object for these users and places that object in the OnDemand Services Users container.

Users who already have an eDirectory User object will then have two User objects. To Log On to Novell OnDemand Services 1.5, these two-account users use the username and password they entered when they self-registered for Novell OnDemand Services.

Do a Little

If the idea of each user having two User objects doesn't appeal to you, don't worry. With a little more effort, you can avoid this situation by configuring No-

vell OnDemand Services 1.5 to support users in other eDirectory containers. By doing so, you enable users with existing eDirectory User objects to log in to Novell OnDemand Services using their existing eDirectory username and password. The only possible catch to this option is that users have to enter their eDirectory username in its full context—for example, dpearson.provo.novell.

Do a Little More

If you have learned that users aren't really good at remembering their full eDirectory context, you can exert a little more effort and avoid this situation. You can configure Novell OnDemand Services 1.5 to support users in other containers and then create aliases for these User objects in the OnDemand Services Users container.

Next, you assign the Alias objects the same username and password that is associated with each actual User object. If you do this, you enable users to log in to your OnDemand server using their ordi-

nary eDirectory username (for example, dpearson) and password.

As you may expect, User objects inherit rights to Novell OnDemand Services 1.5 from the Users container in which these objects reside. You will have to assign the appropriate rights to any and all containers holding User objects that require access to Novell OnDemand Services 1.5. The "appropriate rights" include, for example, Read and Compare rights to the Packages container.

TERMINAL SERVER ACCOUNTS?

DEFRAME'S GOT YOU COVERED

The DeFrame component of Novell OnDemand Services 1.5 creates user accounts for the terminal server differently than it creates accounts for the OnDemand server—but in neither case do you have to create user accounts. DeFrame uses (among other eDirectory objects) the user's eDirectory User object and Novell Client 32 running on the terminal server to create a temporary user account on this server. This user

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DeFrame Watches DeLoad on De Server

The DeFrame component of Novell OnDemand Services 1.5 has a load-balancing solution that works with Novell eDirectory. This load-balancing solution ensures that DeFrame always launches an application from whichever server has the most available resources. This means that you can easily add more terminal servers as the need arises, thus enabling you to add applications and increase the number of users accessing those applications. This load-balancing solution includes the following two services:

- DeLoad
- DeWatch

DELOAD

DeLoad is a service that you run on every terminal server that you want load balanced. This service calculates a value that represents that server's relative load (or resource availability). DeLoad calculates this value using a combination of the following variables:

- CPU utilization
- Memory utilization
- Virtual memory utilization
- Page file utilization
- Number of users

Using the DeFrame snap-in for ConsoleOne, you can open the Server Load Configuration tab for each Terminal Server object to set the parameters under which the DeLoad service should run. You can indicate which of the above variables should be weighted the most and least heavily. For example, if you have servers with fast CPUs and limited memory, you may set parameters such that DeLoad weighs memory utilization more heavily than CPU utilization.

DeLoad sends each server's resource-availability value to its eDirectory server object in the eDirectory tree. By default, DeLoad reports the values to this object every four seconds, but you can change this interval by resetting the Load Refresh Rate, which is also located under the Server Load Configuration tab.

DEWATCH

DeWatch is a service that you need to run on a minimum of one terminal server. (If you want failover functionality, you need to run it on at least two terminal servers.) Every ten seconds, DeWatch checks the resource-availability values for each terminal server on which DeLoad is running. It uses these values to generate a matrix. From this matrix, DeWatch determines from which server a requested application should be launched. DeWatch then adds this server's IP address to the Application object's Preferred Server field.

For example, suppose the matrix indicates Servers A, B, and C and Applications 1, 2, and 3. Further suppose that Application 1 is running on each of the three servers. DeWatch consults this matrix to determine which of the servers is the least busy, and then updates the Application 1 object's Preferred Server field accordingly. In this case, assume that Server B during a particular 10-second interval is the least busy. Hence, when User Bob requests Application 1 during this 10-second interval, DeFrame checks this application's eDirectory object. It finds that the Preferred Server for Application 1 is Server B. Hence, it returns the IP address for Server B to the user's workstation, which accordingly launches Application 1 from Server B.

DeFrame's use of eDirectory to report each server's relative availability is more efficient than other load-balancing solutions (such as the Citrix MetaFrame 1.8 solution). These solutions require servers to use the Service Advertising Protocol (SAP) to broadcast messages regarding their availability. These broadcast messages consume bandwidth. Because the DeFrame load-balancing solution uses the directory (rather than SAP broadcast messages) to report a server's resource availability, you save bandwidth. ●

account lasts only for the duration of the session.

Before establishing a session between a user and an application running on a terminal server, DeFrame also automatically loads the required client software, based on terminal server type. For example, suppose user Joe chooses to launch Corel WordPerfect, which you have configured Novell OnDemand Services to deliver using the DeFrame component. How does Joe access the server running WordPerfect without you creating an account on that server? And how does Joe establish a session with this server without installing client software?

You can get the gist of the answers to these questions through the steps (see Figure 3 on p. 32) of a typical DeFrame session, which include the following:

1. When Joe selects WordPerfect, the DeFrame component of Novell OnDemand Services checks Joe's eDirectory User object to determine whether or not he has rights to this application.
2. Novell OnDemand Services 1.5 checks the WordPerfect eDirectory object to determine a couple of things, including the following:
 - Novell OnDemand Services 1.5 determines the type of server on which WordPerfect is running. If WordPerfect is running on a Windows terminal server (without Citrix), the OnDemand server automatically pushes the TSAC/RDP browser plug-in to the user's workstation. If WordPerfect is running on a Citrix server, the OnDemand server automatically pushes the ICA browser plug-in to the user's workstation.
 - Novell OnDemand Services 1.5 determines which server is the preferred server. (For more information about how Novell OnDemand Services 1.5 knows which server is the preferred server, see "DeFrame Watches DeLoad on De Server.")
3. Novell OnDemand Services 1.5 consults the preferred server's Server object to determine this server's IP address.
4. Novell OnDemand Services 1.5 passes the necessary eDirectory information (including the user's rights and the location of the preferred server) to the browser plug-in running on the user's workstation.

5. Novell OnDemand Services 1.5 then creates a dynamic user account for this user on the preferred terminal server and uses the Novell Client 32 to authenticate this session to eDirectory.
6. The browser plug-in then establishes a session with the preferred terminal server, using either TSAC/RDP or ICA, depending on whether the server is a Windows or Citrix terminal server.
7. Novell OnDemand Services 1.5 then launches the application, which remains on the server.
8. When the user ends the session, Novell OnDemand Services 1.5 removes the virtual user account for the server with which this user was communicating.

The speed at which all of this occurs varies, of course. However, applications that Novell OnDemand Services 1.5 delivers using its DeFrame component perform well even in non-broadband environments because the only data that crosses the wire are mouse clicks, keystrokes, and video bits. Test this claim

for yourself by launching one of the applications from Novell's OnDemand Services demonstration site at <http://ondemand.novell.com> using a dial-up connection.

ALL THAT IT CAN BE

Novell OnDemand Services 1.5 simplifies the delivery, secures the use, and accelerates the performance of eProvisions—most notably Windows 32-bit applications—inside and outside your company's firewall. Using Novell OnDemand Services 1.5 affords several benefits that delivering Windows 32-bit applications directly from terminal servers alone cannot.

Because Novell OnDemand Services 1.5 is integrated with eDirectory, you do not need to use either NT Domains or Active Directory to manage your terminal servers, your terminal server users, or the applications running on these servers. Integration with eDirectory also enables Novell OnDemand Services 1.5 to load balance your servers so that users launch

applications from servers with the most available resources.

Further, Novell OnDemand Services 1.5 automatically creates user accounts on your OnDemand server and creates dynamic user accounts on your terminal servers—so you don't have to create user accounts anywhere. Also, by using eDirectory, Novell OnDemand Services 1.5 enables you to centrally manage your user accounts as well as the servers and applications that comprise your thin-client computing environment. In addition, Novell OnDemand Services 1.5 spares you and your users the hassle of manually installing the client software needed to access terminal server applications.

The bottom line is that Novell OnDemand Services 1.5 makes your thin-client computing environment precisely what it should be: an environment that saves you time (and your company money).

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