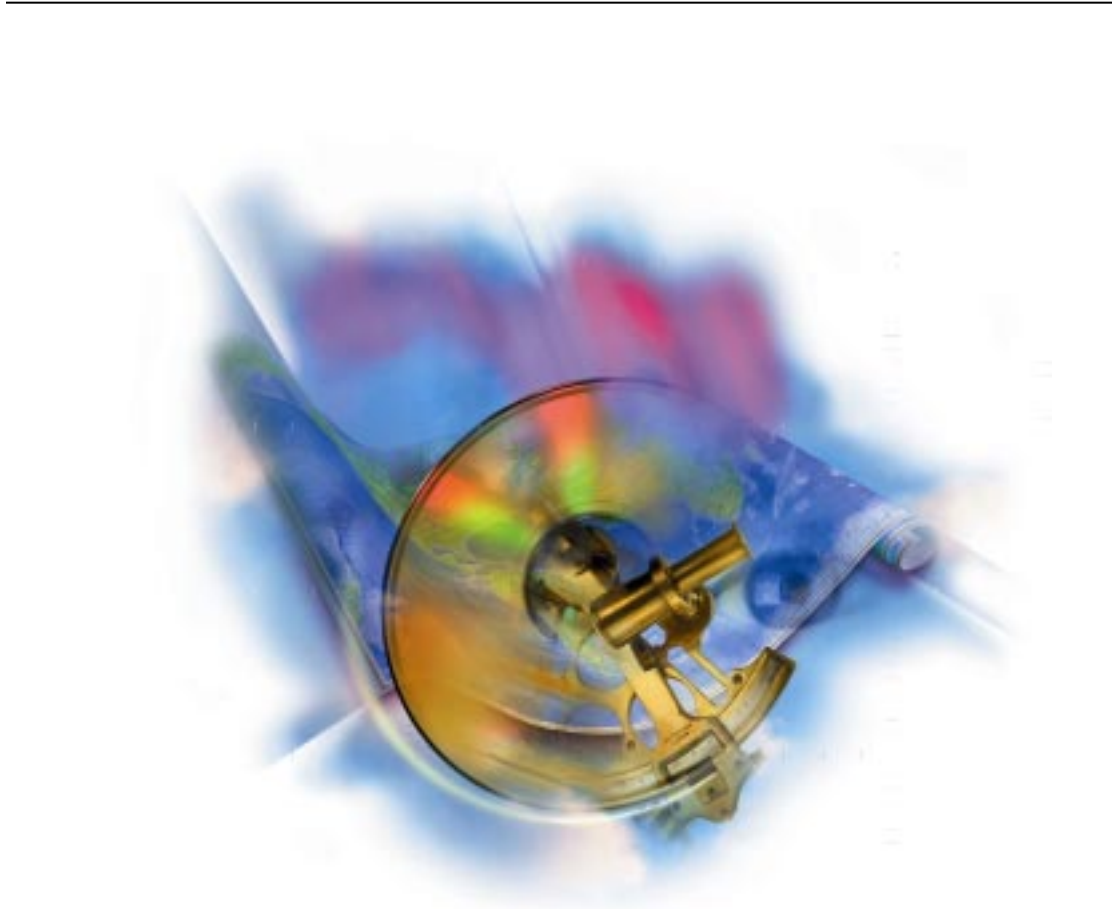


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ZENworks 2.0  
CONSULTANT GUIDE

**Novell**®

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# Introduction

## Target Audience

The Consultant, is referred to as “you” throughout this document.

This document is not intended to be turned over to the customer.

## Purpose

This consultant guide is intended to assist you in the design and implementation of ZENworks by following Novell Consulting’s best practices. Additionally, this consultant guide is intended to assist you with the report-writing process; much of the verbiage can be copied and pasted into your report template.

This consultant guide is not designed to “do all,” “train all” or “teach all,” nor does it replace any Novell product documentation. References may be given to other documents to help you understand certain concepts or to help you implement certain steps.

This consultant guide is a living document that will be refined as new knowledge and experience is obtained, and as underlying technologies change.

## Skill Set

This document assumes you have experience with:

- NDS and how to design NDS (using Novell Consulting’s NDS Design Methodology).
- What ZENworks is, the benefits it provides to customers, and how to set up the objects used with ZENworks.
- Installing ZENworks, including what cautions to use with respect to NDS when extending the NDS schema.
- Performing an Automatic Client Update (ACU).

## Scope

| <b>ZENworks Consultant Guide Scope</b> |   |
|--|---|
| <b>This consultant guide covers:</b>   | <b>This consultant guide does not cover:</b>  |
| ZENworks 2.0                           | <ul style="list-style-type: none"><li>• Previous versions of ZENworks</li><li>• Upgrades to ZENworks 2.0</li><li>• Integration with third party desktop management packages or ManageWise</li><li>• Training, i.e., not how to create objects and not education on what each of the policies does</li><li>• Tech Support issues</li></ul> |

|  |   |
|--|---|
| <p>ZENworks Design; specifically:</p> <ul style="list-style-type: none"> <li>• Object placement</li> <li>• Object naming</li> <li>• Using container policy package objects</li> <li>• Associations</li> <li>• Replica placement</li> <li>• User Categorization</li> </ul>  | <ul style="list-style-type: none"> <li>• NDS Design (you will be referred to the NDS Design consultant guide for this information)</li> <li>• NDS Health Check (you will be referred to the NDS Health Check consultant guide)</li> </ul> |
| <p>Application Management; specifically:</p> <ul style="list-style-type: none"> <li>• NAL</li> <li>• “Lights Out” distribution</li> <li>• Associations</li> <li>• Minimizing tree walking</li> <li>• SnAppShot</li> </ul>  | <ul style="list-style-type: none"> <li>• Software Metering</li> <li>• Conversions from WinInstall (or another such package)</li> </ul>  |
| <p>Workstation Management; specifically:</p> <ul style="list-style-type: none"> <li>• Workstation Registration</li> <li>• Workstation Manager</li> <li>• Desktop Policies including Extensible Policies (*.ADM)</li> <li>• Printer Policies</li> <li>• Client Configuration Policies (?)</li> <li>• Inventory (Hardware and Software)</li> </ul> | <ul style="list-style-type: none"> <li>• NDPS integration</li> <li>• Reporting</li> </ul>   |
| <p>Remote Management; specifically:</p> <ul style="list-style-type: none"> <li>• Remote Control</li> <li>• File Transfer</li> <li>• Workstation Diagnostics</li> <li>• Help Requester</li> <li>• Remote Execute</li> <li>• Remote View</li> <li>• Chat</li> </ul>  | <ul style="list-style-type: none"> <li>• NT Audit Log</li> <li>• Help Requester integration with third party products</li> </ul>  |
| <ul style="list-style-type: none"> <li>• Automatic Client Upgrade (ACU)</li> </ul>   | <ul style="list-style-type: none"> <li>• Check 2000</li> <li>• Integrating Thin Client Servers (e.g., Citrix) with ZENworks</li> <li>• NT Branch Office Solution</li> <li>• Anti-Virus Software</li> </ul>                                |

## Terminology Used

- The term *prototype* means a representative subset of the production environment, “mocked-up” in a *lab* environment. (Prototype and lab are used synonymously throughout this document.)
- The term *pilot* means the first production deployment to a small subset of production users.
- The term *implementation* means the full production rollout, and is used synonymously with *deployment* throughout this document.
- *Baseline system* (or just *baseline*) is when all ZENworks prerequisites have been met.
- *CPL* = Consulting Project Lead, i.e., the lead consultant for this engagement (if

appropriate)

## Using this Consultant Guide

It is logically designed so that you can start with the “Preparing for the Start of Engagement” section and work your way straight through. No timelines are given for how long each task should take; however, each task should be completed before moving on to the next. This document is intended to serve as a guideline; not as an all-inclusive list of everything that needs to be covered. When in doubt, use common sense. ☺

## Training Curriculum

This list is designed to help you become more technically familiar with ZENworks 2.0. It is not an exhaustive list.

### Novell Education Courses

- NDS Design and Implementation (#575)  
This course teaches network administrators, network designers and networking consultants the skills needed to create an NDS design and implementation strategy. Students will complete an NDS design strategy and implementation schedule using templates that they can re-use to create a design for their workplaces. Students will then use these strategies and schedules to complete a NetWare implementation in a hands-on environment. The processes taught in this course for creating a solid NetWare design have been proven in use with Novell Consulting Services.
- Desktop Management with ZENworks (#780 v1.02)  
This course is a 2-day course designed to provide the basic concepts and features of ZENworks 2.0 and includes the following:
  - \* Implementing ZENworks
  - \* Distributing and Managing Applications Using NAL - includes use of snAppShot for distributing simple and complex applications, lights-out distribution, and workstation application reporting
  - \* Desktop Management Using Workstation Manager - includes new policy wizard and use of extensible policies
  - \* Remote Management
  - \* Maintaining the ZENworks Environment - includes moving and tracking workstations, hardware and software inventory scanning and reporting

Please see Novell Education’s catalog for the latest course information available at:  
<http://education.novell.com/catalog/>

### Advanced Technical Training Courses

Novell Technical Services (NTS) offers a two-day, hands-on Advanced Technical Training course on ZENworks. Course content, which is developed and delivered by Novell Support

Engineers, will teach you how to:

- Distribute and manage applications using ZENWorks Application Launcher in conjunction with the Windows 95 and NT operating systems.
- Set and configure policy to lock down the user desktops, distribute printers and control user administration on an NT workstation.
- Compile a comprehensive hardware and software inventory of your corporate environment.
- Troubleshoot issues by developing an in-depth understanding of background processes.
- Remotely diagnose and resolve issues, troubleshoot remote management components.

For more information and details of scheduled courses in your region, please refer to the following web sites:

Americas:

<http://support.novell.com/additional/advtt/>

EMEA:

<http://support.novell.de/additional/advtt/emea/conf.htm>

## Technical Spotlight Seminars

Novell Education has developed the Novell Technical “Spotlight” Seminars. These seminars have been designed and developed by Senior Novell Instructors within Novell Education following demands from many people who want more specific, in-depth training on a particular subject. These one-day training events are based around solutions and therefore will provide you with cross-product solutions in multiple and diverse network environments.

The aim of the ZENworks one-day Technical Spotlight Seminars is to provide participants with a clear understanding of what happens when they implement ZENworks or some of its components. The Effective use of ZENworks seminar covers:

- How to collect information about the current network
- What happens in mixed IPX/IP environments
- Implications to consider before implementing ZENworks
- Resource usage for different ZENworks components
- The impact to NDS Design
- Resources in use before and after the installation of ZENworks components
- Hints on how to implement ZENworks in the corporate network
- Hints on how to improve the network performance using ZENworks
- An overview of the new features of ZENworks Version 2.0

For more details please refer to the Novell Education web sites at:

Americas:

[http://education.novell.com/pep/tech\\_seminars.html](http://education.novell.com/pep/tech_seminars.html)

EMEA:



<http://www.novell.com/emea/education>

## Novell Consulting Workshop

Novell Consulting offers a two-day ZENworks workshop. This workshop is conducted by a Novell field consultant. The course is designed to be 80% hands-on and 20% lecture.

## ZENworks 2.0 Tool Kit

- [http://www.novell.com/coolsolutions/zenworks/features/a\\_zen2\\_toolkit\\_zw.html](http://www.novell.com/coolsolutions/zenworks/features/a_zen2_toolkit_zw.html)

## LogicSource for ZENworks

- <http://support.novell.com/logicsource/zenworks/>

## ZENworks Cool Solutions Web Site

- <http://www.novell.com/coolsolutions/zenworks>

## AppNotes

<http://developer.novell.com>

- September 1999, "Tips on Using the ZENworks Application Management Tool Kit," by Kevin Prior.
- March 1999, "Using ZENworks to Distribute Windows NT Service Packs," by Kevin Prior and Andrew Rook.
- January 1999, "Using ZENworks to Check Workstation Hardware for Year 2000 Compatibility," by David Doering and Doug Stewart.
- November 1998, "ZENDS Design for Large Sites: Implementing a Replicated ZEN Container," by Timothy Forde
- October 1998, "A ZENworks-Friendly Location Independence Strategy for NetWare Networks," by Timothy Forde.
- October 1998, "Using ZENworks to Distribute and Manage Applications on a Network," by Brad Anderson
- June 1998, "Using ZENworks to Manage Users' Desktops," by Brad Anderson.
- May 1998, "An Introduction to ZENworks: Zero Effort Networking for Users," by Brad Anderson.

## Novell Press Books

The following is a listing of current ZENworks books available from Novell Press:

- Novell's ZENworks™ Administrator's Handbook, by Ron Tanner and Brad Dayley  
ISBN: 0-7645-4561-2

Reader level: Intermediate-Advanced

Overview: Administer and troubleshoot your network from a single point using ZENworks 2. Create applications with snAppShot™, distribute applications, and implement policy packages. Ron Tanner and Brad Dayley demonstrate how ZENworks allows you to administer a network from a single point -- and significantly

reduce costs. Bringing the kind of insights that only come with years of experience working with a product, these authors clearly show you how to use ZENworks's full range of server-to-desktop services -- and manage your network for optimal efficiency.

Novell Press's web site is: <http://www.idgbooks.com>.

# Preparing for the Start of Engagement

The following tasks should be completed by the lead consultant before the start of the engagement. Please allow enough time in advance of the engagement for you and your client to complete all required preliminary tasks.

## Preparing for the Initial Engagement Meeting

Before the initial engagement meeting, you should:

- Be familiar with your company's work order agreement. Bring a hard copy (preferably the signed one) to the initial engagement meeting.
- Be familiar with the ZENworks 2.0 consultant guide. Have a copy of this consultant guide with you during the entire project.
- Be prepared to "chalk-talk" or provide a slide show presentation on the products and/or solutions.
- Be aware that an initial meeting might include high-level corporate or IS management personnel. Dress appropriately.
- Define the lab requirements you will need the customer to have in their lab (see the sample in Appendix A). Bring the completed lab requirements document to the initial engagement meeting.
- Check out the minimum patch list for ZENworks at <http://support.novell.com>
- Familiarize yourself with the latest Technical Information Documents (TIDs) for ZENworks at <http://support.novell.com>.

## Pre-engagement Discussion with Client

This discussion is usually conducted via telephone and email. During this discussion:

- Schedule the initial engagement meeting(s). Try to schedule at least a four-hour block of time in which to meet with the customer's appropriate personnel (for example, their project manager, their NDS technical person, LAN/WAN person, and so forth). You want to ensure that all customer personnel who will have a part in this engagement are present at this meeting.

- ❑ Determine if high-level management will be at this meeting. If so, be prepared to provide a management-level overview of the project.
  
- ❑ Ensure that the following information will be available at the initial engagement meeting:
  - LAN/WAN diagrams including routing and switching infrastructure and link speeds.
  - TCP/IP infrastructure (DNS, DHCP)
  - NDS design documents
  - What equipment their lab has or will have for this project
  
- ❑ Determine if system access requirements (e.g., badges) will be necessary to gain access to the lab or any other meeting or work area. Arrange for access in advance.
  
- ❑ Discuss required levels of access for Novell consultants to the production and lab NDS trees and arrange for that access for Novell consultants to be provided in advance of the engagement.
  
- ❑ Discuss required levels of access to Internet and arrange for special requirements in advance. At a minimum, this should include access to proxy servers, if necessary. Access to your e-mail system and your companies Intranet may require additional access through the firewall. Some clients are willing and able to provide this and some are not.  
As an alternative, make sure an async modem line is available.

# Start of Engagement

All tasks below should be completed before moving on to the rest of the engagement.

## Task 1: Conduct Initial Engagement Meeting

This is your first on-site meeting with the customer. However, this meeting may consist of several meetings with different levels of company personnel. The goal for you is to cover all items below (in however many meetings are necessary) before moving on. The following information should be covered and documented during the meeting, as it will become the customer's preliminary report:

### Items to Cover

- Introduce all your consulting team members and their roles in this engagement.
- Determine all of the customer's team members and their roles in this engagement.
- Determine what the customer expects of you. Essentially, you are just confirming that what was scoped in the work order you received is consistent with what the customer wants.
- Discuss the lab requirements with the customer (see Appendix A). Adjust as appropriate. (Appendix A will become part of the preliminary report.)
- Discuss (and refine) critical success factors (see Appendix E). All success factors will need to be defined before starting the prototype work in the lab.

Collect the following documents from the customer (the ones you requested be on-hand for this meeting):

- LAN/WAN diagrams including routing and switching infrastructure and link speeds. If this information is not available, determine when you can get it. This information is necessary to review NDS partitions and replicas so that the proper ZENworks "search" restrictions can be set to avoid excessive tree walking.
- TCP/IP infrastructure (DNS, DHCP). If this information is not available, determine when you can get it. ZENworks components can be configured over IPX or IP so their TCP/IP infrastructure documents will be necessary.
- NDS design documents. This information will be used to determine appropriate object placement and naming.
- If the customer will be using any component of ZENworks that requires a Policy Package object, you need to determine with them:

- How to categorize users (see and complete Appendix B).
- Which policies and options will be implemented by which categories of users (see and complete Appendix C).

**Note:** This is a very important task for efficiently designing ZENworks. Both Appendix B and C should be determined and filled out during the initial engagement meeting so that lab work can proceed. Once they are completed, Appendix B and C will become part of the customer's preliminary report.

- If the customer will be using software distribution (NAL), you need to determine with them:
  - The scope of what we're doing with applications and determining who gets what applications (see and complete Appendix D).

**Note:** This is a very important task for efficiently designing ZENworks. Appendix D should be determined and filled out during the initial engagement meeting so that lab work can proceed. Once it is completed, Appendix D will become part of the customer's preliminary report.

- Determine and set up milestones with the customer; e.g., Phase 1 = having NAL implemented by <DATE>; Phase 2 = having Remote Control implemented by <DATE>, etc.

These milestones should lay out the schedule for the rest of the project.

## Task 2: Prepare Preliminary Report

The preliminary report is based upon the findings in the initial engagement meeting.

**Note:** A preliminary report template is in Appendix G and covers the "Items to Cover" section above. Feel free to add to this report template, as appropriate.

## Task 3: Deliver Preliminary Report to Customer

# Perform Technical Assessment and Impact Study

“Getting to a ZENworks Baseline System” is what this section is all about. You want to make sure that the customer’s current environment = ZENworks prerequisites. Being at a baseline system is necessary before implementation; however, the design phase can proceed while not at a baseline system.

Many customer projects have suffered limited success or even failure as a result of their not properly assessing the current environment prior to deploying ZENworks. Problems can be minimized greatly by careful review of the current environment. To minimize this risk, conducts a technical assessment and impact study of the customer’s current environment to determine if it is capable of supporting ZENworks.

The *technical assessment* compares the customer’s current NetWare environment with the ZENworks minimum recommendations (or Novell Customer Services’ real-world recommendations) to identify deficiencies.

The *impact study* documents the impact of each deficiency as it pertains to deploying ZENworks. The impact study should also document the steps necessary to correct the deficiency. This ensures that the all baseline requirements are met prior to any production implementations.

## Task 1: Analyze Customer’s Current Environment

Inputs needed:

- Completed PFC, specifically Tables 1, 2, 3, 6, 8, 10, and 11
- NDS Design Documents
- LAN/WAN Diagrams
- TCP/IP Infrastructure Diagrams

### Assess Workstation Operating Systems

Using the completed PFC table 1, compare the customer’s current client workstations and operating systems with the ZENworks requirements in Appendix F, table 1.

### Assess Client Software

Using the completed PFC table 2, compare the customer’s current client software with the ZENworks requirements in Appendix F, table 2.

### Assess NetWare Server Information

Using the completed PFC table 3, compare the customer's current NetWare server information with the ZENworks requirements in Appendix F, table 3.

## **Assess Server Volume Structure**

Using the completed PFC table 6, compare the customer's server volume structure with the ZENworks requirements in Appendix F, table 4.

## **Assess NT Server Information**

Using the completed PFC table 8, compare the customer's current NT server information with the ZENworks requirements in Appendix F, table 5.

## **Assess Server Applications**

Using the completed PFC table 10, compare the customer's server applications with the suggestions in Appendix F, table 6.

## **Assess LAN/WAN Architecture**

Using the customer's LAN/WAN diagrams, compare the customer's current infrastructure with the suggestions in Appendix F, table 7.

## **Assess TCP/IP Infrastructure**

Using the customer's TCP/IP infrastructure diagrams, compare the customer's current infrastructure with the suggestions in Appendix F, table 8.

## **Assess NDS Design**

Using the customer's NDS design documents, compare the customer's current NDS tree with the suggestions in Appendix F, table 9.

## **Assess NDS Partition/Replica Matrix**

Using the completed PFC table 11, compare the customer's current partitioning and replication scheme with the suggestions in Appendix F, table 10.

## **NDS Health Check**

**Note:** The NDS Health Check does not need to be performed until shortly before ZENworks implementation (specifically the ZENworks pilot); however, if a significant NDS redesign is going to be performed (based upon the assessment made above), you may want to consider performing a health check after the redesign and then again before ZENworks implementation.

**Note:** See Appendix F, table 11 for some considerations. Refer to the NDS Health Check consultant guide for assistance with this step.



## Task 2: Prepare Technical Assessment/Impact Study Report

The technical assessment and impact study report is a very important document for ensuring that the prerequisites are addressed and met before implementing ZENworks. The following things must be done to complete the report:

1. Document the deficiencies from task 1 above.
2. Document the solutions for resolving these deficiencies. You can even note that further testing needs to be done in the lab.
3. Document the possible impacts if these deficiencies are not resolved before the ZENworks implementation—again even noting that further testing needs to be done in the lab.
4. Determine who will complete these tasks. If you will be doing the pilot and/or implementation, you will then need to ensure the system is at a baseline. If you are just doing the ZENworks design, the system does not have to be at a baseline. However, you must stress to the customer that they need to be at a baseline; this can be placed in the technical assessment and impact study report.

**Note:** A technical assessment and impact study report template is in Appendix G.

## Task 3: Deliver Technical Assessment/Impact Study Report to Customer

# ZENworks Design

- This section could be done while the customer is not at a “baseline” system since it is just determining and documenting how ZENworks will be designed.
- This section covers best practices for designing ZENworks. It does not cover an NDS design or redesign.
- This section assumes a design for the overall tree. This should be possible since this section just talks about where to create, name, and how to associate policy package objects and application objects.
- Task 1: Determine “Best Design Practice” To Use for Customer’s Environment

There are different and sound ways to design ZENworks (just like there are different and sound ways to design an NDS Tree). As you read through this section, you will need to determine the “best practice” to use for your customer. When there are different options, they will be labeled “Recommendation 1,” Recommendation 2,” etc.

You must have a copy of the customer’s NDS design documents before you start to design ZENworks. The customer’s NDS tree should have been analyzed as part of the previous Technical Assessment/Impact Study section; therefore, it is assumed here that you will be working off the latest (or to-be-redesigned) NDS tree documentation

## General

### Disk Space Recommendations

ZENworks does not place immediate hard disk requirements, but you should plan what size hard disk you need to handle volume SYS for three years. In light of future products that are being written to extend the NDS schema, it is reasonable to assume that NDS will use more disk space. For example, in NetWare 5, Java is available that runs directly from the SYS: volume with memory paging required. GUI Server interfaces, as expected, will require more disk space.

We recommend that you create a SYS volume of at least 4 GB to accommodate future growth. This recommendation assumes that network printing has been moved off of the SYS: volume. If printing remains on SYS: volume, then the disk space requirement would increase.

### Installation Recommendations

- Rights to modify the schema of the NDS tree (Supervisor right to [Root]).
- File System Supervisor right to the NetWare server where you install ZENworks.
- NDS Supervisor right to the NDS container where you install ZENworks (sample NAL objects will be created in this container).

## Policy Package Objects

Policy Package Objects are a fundamental component of ZENworks. There are three categories of policy package objects to consider when designing ZENworks:

- Container Policy Package Objects
- User Policy Package Objects
- Workstation Policy Package Objects

## Container Policy Package Objects

Container Policy Package objects should be created at each OU that corresponds to a WAN link. Then a Search policy should be enabled within each Container Policy Package object to minimize tree walking. Without this Search policy, the default is for users to search up to the [Root] looking for associated policies which, more than likely, will cause traffic on WAN links.

There are two purposes for a Container Policy Package object:

- Minimize WAN traffic (by implementing the Search policy within the Container Policy Package).
- Control the policy search order, which by default is object (user or workstation), group, then container.

### Placement

Create a Container Policy Package object at the highest level of the tree as needed. It should never exceed the location or site container (these represent a WAN boundary in a properly designed and partitioned tree). There should usually be just one Container Policy Package object per physical site.

### Naming

Establish naming conventions for Container Policy Package objects. A good option is to name the Container Policy Package object for the physical site you are creating it in. For example:

- Dallas\_CPPO
- Bracknell\_CPPO

### Associations

The Container Policy Package object can only be associated with containers. Associate the Container Policy Package object with the container you created it in (see placement section above); this ensures access to the Container Policy Package object is not across a WAN link.

### Minimizing WAN Traffic

The Search policy within a Container Policy Package object can restrict how far the client component searches for associated policy packages (“Search Level”). There are two ways you can implement a Search policy:

#### Recommendation #1

This method works best if you are unsure whether or not a container representing a partition is across a WAN link.

- Set the “Search For Policies Up To” the container which represents the highest container “this side” of the WAN link. The default is set to [Root].
- Leave the “Search Level” set to 0 (the default) which searches to whatever is

specified in the “Search For Policies Up To” field, in this case the *Specified Container*. A setting of “1” searches 1 level above the current level, where current level is the level set in “Search For Policies Up To”, “2” searches 2 levels above the current level, etc., and “-1” limits the search up to, but not including, the current level.

### **Recommendation #2**

- Set the “Search For Policies Up To” to *Partition*. Setting this to *Partition* assumes, of course, that the partitioning and replication scheme is properly set up. The default is set to [Root].
- Leave the “Search Level” set to 0 (the default) which searches to whatever is specified in the “Search For Policies Up To” field, in this case the *Partition Root*. A setting of “1” searches 1 level above the current level, where current level is the level set in “Search For Policies Up To”, “2” searches 2 levels above the current level, etc., and “-1” limits the search up to, but not including, the current level.

## **User Policy Package Objects**

### **Placement**

User Policy Package objects should be created close to the users who will be accessing them. User access to this User Policy Package object should not be across a WAN link.

**Recommendation #1:** Create and place User Policy Package objects in the physical location/site container. For example:

DALLAS.NOVELL

This solution works very well for centralized management control because you know every User Policy Package object can be found at the physical site container. This is the easiest solution and should be used where possible. Also, this is where you should place User Policy Package objects that are considered “corporate-mandated.” In this case, you should set up access control to this User Policy Package object so that only “centralized administrators” can edit the properties.

**Recommendation #2:** Create and place User Policy Package objects in organizational-type containers beneath the physical location/site container. For example:

SALES.DALLAS.NOVELL

or

CONSULTING.DALLAS.NOVELL.

This solution works very well for decentralized management control. It is appropriate at sites where container administrators want to set up and manage their own container-based users.

### **Naming**

Establish naming conventions for User Policy Package objects.

**Recommendation #1:** Name the User Policy Package object for its category of users (as defined in Appendix B during the initial engagement meeting). For example:

Category\_A\_UPPO

or

Category\_B\_UPPO

This assumes that any policy you implement within the User Policy Package object then applies to this same category of users. This makes the most sense for management and organizational purposes and should be used when possible.

**Recommendation #2:** Name the User Policy Package object for the policy you are enabling within it. For example:

Desktop\_Prefs\_UPPO

or

User\_Policies\_UPPO

This type of naming standard makes sense when you will be creating separate User Policy Package objects for each type of policy you may want to enable. This is tedious and should generally not be used. It makes sense in cases where a specific group of users get a Desktop Preferences policy but this same group of users does not get the User Policies.

Both options are technically sound. The decision regarding which option to use is solely management-related. A variation can be used. The key point here is to devise and document standard naming conventions.

### Associations

User Policy Package objects can be associated with NDS containers, groups, or users. The recommendation of Novell is to use container-based associations for the following three reasons:

1. You are leveraging NDS and the power of container-based inheritance.
2. You minimize creating extra groups for policy purposes, where creating groups is generally employing a bindery-based (NetWare 3) approach and not leveraging the power of NDS.
3. Human error is possible when using group-based associations because there is no automatic way to detect being a member of a “policy A” and a “policy B” group. If this does occur, mixed policy results are possible and difficult to detect.

If a *single* User Policy Package object is used for all users (i.e., there are no categories of users defined from Appendix B), then associate the User Policy Package object with the container you created it in.

When there are *multiple* User Policy Package objects needed for categories of users (as defined from Appendix B), remember that only one User Policy Package object can be associated with a single container. Consider the following options:

- policy stacking
- grouping
- associating by users

**Policy stacking.** With this option you associate to NDS containers (for the three reasons mentioned above). To employ policy stacking:

- Apply a User Policy Package object to the site container (which will be inherited by all users at the site).
- Apply another User Policy Package object to the business unit or workgroup containers (which will be inherited by a smaller subset of users).
- Apply another User Policy Package object to groups and/or users (which will be inherited by even smaller subsets of users).

**Policy Stacking Example:**

**Note:** This example is based on the default policy search path of \object\group\container. This sequence can be changed in the Search Policy, Search Order options within a Container Policy Package object.

User Policy Package Object (UPPO) A is “general”, i.e., associated with a greater population of users:

- x Dynamic Local User
- x Help Desk
- x NT Desktop Preferences
- x NT User Policies

User Policy Package Object (UPPO) B is “less general”, i.e., associated with a smaller subset of users (where the settings within the policy can be either more or less restrictive):

- Dynamic Local User
- Help Desk
- NT Desktop Preferences
- x NT User Policies

NDS Structure:

O=Novell: UPPO A “general” associated here

OU=Americas: UPPO B “less general” associated here

OU=Dal

SallyS

In this example, SallyS’s effective policies are:

- Dynamic Local User from UPPO A
- Help Desk from UPPO A
- NT Desktop Preferences from UPPO A
- NT User Policies from UPPO B

There was “overlap” with the NT User Policies in UPPO A and B. Since UPPO B was closer to SallyS (i.e., it was associated with Americas), the NT User Policies from UPPO B “won.” The key thing to realize is that the **policy** closest to the user “wins,” not the policy package object. This is further demonstrated by the fact that the property button in NWAdmin is “Effective Policies.”

**Note:** Policy Stacking works best when the number of categories of users is small (two or three). As the number of categories increases this approach becomes more difficult to manage. You can use the User object’s “Effective Policies” property to ensure that policy stacking is being properly implemented.

**Grouping.** If the lower-level NDS design does not facilitate Policy Stacking (and an NDS redesign is not going to be done) groups can be used. We recommend that you create new NDS groups that match the categories defined in Appendix B). Existing groups can be used if you are certain that users are not members of multiple groups.

**Associating by users.** User-based associations should be kept to a minimum due to the extra management and maintenance required.

## Workstation Policy Package Objects

### Placement

Workstation Policy Package objects should be created close to the workstations that will be accessing them. Workstation access to this Workstation Policy Package object should not be across a WAN link.

**Recommendation #1:** Create and place Workstation Policy Package objects in the physical location/site container. For example:

DALLAS.NOVELL

This solution works very well for centralized management control because you know every Workstation Policy Package object can be found at the physical site container. This is the easiest solution and should be used where possible. Also, this is where you should place Workstation Policy Package objects that are considered “corporate-mandated.” In this case, you should set up access control to this Workstation Policy Package object so that only “centralized administrators” can edit the properties.

**Recommendation #2:** Create and place Workstation Policy Package objects in organizational-type containers beneath the physical location/site container. For example:

SALES.DALLAS.NOVELL

or

CONSULTING.DALLAS.NOVELL.

This solution works very well for decentralized management control. It is appropriate at sites where container administrators want to set up and manage their own container-based workstations.

**Note:** We do not recommend placing the Workstation Policy Package object in the dedicated WORKSTATIONS container, due to security considerations. Security becomes an issue in an environment where you want to give Help Desk people just the minimal rights (e.g., to remote

control workstations), but nothing else.

### **Naming**

Establish naming conventions for Workstation Policy Package objects.

**Recommendation #1:** Name the Workstation Policy Package object for its category of users (as was defined in Appendix B). For example:

Category\_A\_WPPO

or

Category\_B\_WPPO

This assumes that any policy you implement within the Workstation Policy Package object then applies to this same category of users. This makes the most sense for management and organizational purposes and should be used when possible.

**Recommendation #2:** Name the Workstation Policy Package object for the policy you are enabling within it. For example:

Remote\_Control\_WPPO

or

Inventory\_WPPO

This type of naming standard makes sense when you will be creating separate Workstation Policy Package objects for each type of policy you may want to enable. This is tedious and should generally not be used. It makes sense in cases where a specific group of users get a Remote Control policy but the same group of users does not get the Inventory policy.

Both options are technically sound. The decision regarding which option to use is solely management-related. A variation can be used. The key point here is to devise and document standard naming conventions.

### **Associations**

Workstation Policy Package objects can be associated with NDS containers, workstation groups, or individual workstations.

Associate the Workstation Policy Package object with either:

The WORKSTATIONS container

or

Workstation group objects

and

Individual workstation objects

The goal is to associate the appropriate Workstation Policy Package object with the appropriate



“category” of workstations defined in Appendix B.

If you associate to an individual workstation object ensure that the workstation object is not also part of a workstation group object.

**Note:** Policy stacking should not be necessary with Workstation Policy Package objects.

## Workstation Objects

### Placement

Create a dedicated OU=WORKSTATIONS container. While we generally do not recommend resource-specific containers, there are three reasons for this exception:

1. The number of workstations imported will match the number of users. By keeping the workstations in a separate container, you can easily partition off this container if it exceeds the recommended number of objects per partition.
2. Security can be easier. For example, you can give help desk people just the rights to remote control workstations in an individual WORKSTATIONS container.
3. Users do not need to access the workstation objects (which is generally the reason we recommend putting resources in the same containers as users). Instead, the Novell Client itself and network administrators (or help desk people) will access the workstation objects.

**Recommendation #1:** Create and place the dedicated WORKSTATIONS container beneath the physical location/site container. For example:

WORKSTATIONS.DALLAS.NOVELL

**Recommendation #2:** Create and place a dedicated WORKSTATIONS container beneath a departmental container under the physical location/site container. For example:

WORKSTATIONS.CONSULTING.DALLAS.NOVELL

**Recommendation #3:** Small tree; workstations in same container as users.

### Naming

The default name for an imported workstation object is Computer + Network Address, where Computer is the NetBIOS computer name of the Windows workstation (stored in the registry) and Network Address is either the workstation's IPX or IP network address (depending upon the preferred network address set in the Workstation Import policy).

**Recommendation:** If you are going to use the computer name, devise a standard naming scheme for workstations and push it out to all workstations using NAL or some other automated method. For example, you can use an asset tag number or some other number (or name) that uniquely identifies a workstation on the network. This will make it easier for help desk people to recognize the workstation object by name in NWAdmn32.

**Note:** A workstation object can always be renamed from within NWAdmn32; however, if the workstation object ever needs to be re-imported it will pick up the computer name as it is set in the workstation's registry. In this case, the workstation object would have to be renamed again

in NWAdmn32 to be meaningful.

## Application Objects

### Placement

#### Recommendation #1

Create the Application objects close to the users who will be accessing them. Accessing Application objects across WAN links should be avoided. Instead, create duplicate Application objects in each geographic location if necessary. When you create a new Application object, you are given the option to create it from an existing Application object in the tree. After copying an Application object, you need to simply change the source server, path, drive mapping, and other properties (as necessary). Do not use a generic NDS object copy utility to create new Application objects.

If a small number of Application objects are going to be created they can be placed in the same container as their users.

If a significant number of Application objects are going to be created, consider creating dedicated Application containers for each site. When used, Application object containers should be near the containers which hold the users of those applications. As with Workstation containers, Application container placement should minimize “tree walking” during login. As with Workstation containers, Application containers should be in the same partition as the users or in an immediate parent or child partition and should not be separated from users by WAN links. Novell recommends the following placement strategies:

**Option #1:** For a large number of applications, create and place the dedicated Applications container beneath the physical location/site container. For example:

APPLICATIONS.DALLAS.NOVELL

This is the preferred approach if application objects are shared by users in multiple child containers.

**Option #2:** For a large number of applications, create and place a dedicated Applications container beneath a departmental container under the physical location/site container. For example:

APPLICATIONS.CONSULTING.DALLAS.NOVELL

This approach can work well when most applications are used by specific departments.

#### Recommendation #2

An option to creating/duplicating application objects for each container at each physical site is to create an OU=APPLICATIONS container and then replicate the contents of this container to the appropriate sites. For more information on this process, please see the November 1998 AppNote, “ZENDS Design for Large Sites: Implementing a Replicated ZEN Container,” by Timothy Forde. This type of implementation has worked for companies with reliable WAN links and for properly partitioned/replicated sites because the Application object properties generally do not change after they have been set up..

**Note:** You may want to discuss this type of design with another consultant or the customer (if

appropriate). This approach should be used for large sites where creating each application object is too time-consuming. Also, this approach may not be needed if the customer is or will be using ZEN for Servers.

## Naming

Naming conventions should be established for application objects.

**Recommendation #1:** Combine abbreviated forms of program names and server names in the following way:

**<PROGRAM\_NAME>\_<SERVER\_NAME>**

For example:

### NetWare Server Holding Applications

### Matching Application objects

PRV-APPSRV1:

|                             |                |
|-----------------------------|----------------|
| Word Processing application | WP_PRV-APPSRV1 |
| Spread Sheet application    | SS_PRV-APPSRV1 |
| E-mail application          | EM_PRV-APPSRV1 |
| Database application        | DB_PRV-APPSRV1 |

PRV-APPSRV2:

|                             |                |
|-----------------------------|----------------|
| Word Processing application | WP_PRV-APPSRV2 |
| Spread Sheet application    | SS_PRV-APPSRV2 |
| E-mail application          | EM_PRV-APPSRV2 |
| Database application        | DB_PRV-APPSRV2 |

PRV-APPSRV3:

|                             |                |
|-----------------------------|----------------|
| Word Processing application | WP_PRV-APPSRV3 |
| Spread Sheet application    | SS_PRV-APPSRV3 |
| E-mail application          | EM_PRV-APPSRV3 |
| Database application        | DB_PRV-APPSRV3 |

This naming convention works well for “global” applications that all users in the company will get. The NetWare server name is optional, but the convention of adding it enables you to set up and effectively use the fault tolerance and load balancing features built into the ZENworks product.

**Note:** This recommendation is for the name of the application (leaf) object that displays in NWAdmin. This name does not have to appear in the users’ Application Launcher window,

although keeping the two names fairly close is recommended for ease of management.

**Recommendation #2:** Name the application object for the group of users who will be accessing it. This naming convention works well for “departmental” applications which, by definition, won’t be distributed to all users in the company. For example:

TaxCut\_for\_Accountants

or

PeopleSoft\_for\_HumanResources

Both options are technically sound. The decision regarding which option to use, or a variation of the above recommendations, is solely management-related. The key is that standard naming conventions should be established for ease of management.

## Associations

Application objects can be associated with NDS containers, groups, or users. We recommend to use container-based associations where possible due to the benefits derived from NDS inheritance and the ability to restrict searching across WAN links.

### Associating to containers:

*Global* applications should be associated with each site container. For example:

DALLAS.NOVELL

Inheritance will ensure all users beneath DAL receive this application, which is the goal for a global application.

*Departmental* applications should be associated with each departmental container at each site. For example:

SALES.DALLAS.NOVELL

or

CONSULTING.DAL.NOVELL.

**Note:** If the lower-level containers don’t match the users needing this departmental application, then groups need to be used. Optionally, an NDS redesign can be considered.

### Associating to groups:

Create groups containing users who need departmental applications and associate with the group.

### Associating to users:

This may be the easiest solution when an application to be distributed is only needed by a couple of users, since you would not want to create a group just for two users nor would you want to consider an NDS redesign.

## Minimizing WAN Traffic

**Note:** It is very important that you appropriately set the “Top object” and “Set application inheritance level” values. Without these settings, NAL will (or can be) be very slow to launch.

The Launcher Configuration property on either a container or user object is used to minimize NAL-related traffic across WAN links similar to the way that a Search policy in a Container Policy Package object is used to minimize Policy Package traffic. Launcher configuration settings are inherited from parent to parent, down to the user. The setting closest to the user “wins.”

Two Launcher Configuration properties can restrict NAL traffic across WAN links:

### (1) Top Object

At each physical site, set the “Top object” value to the site location container, making sure that this container is not across a WAN link. The following screen shot (Figure 1) presents an example where DAL is the top-most, partitioned container to all users in Dallas:

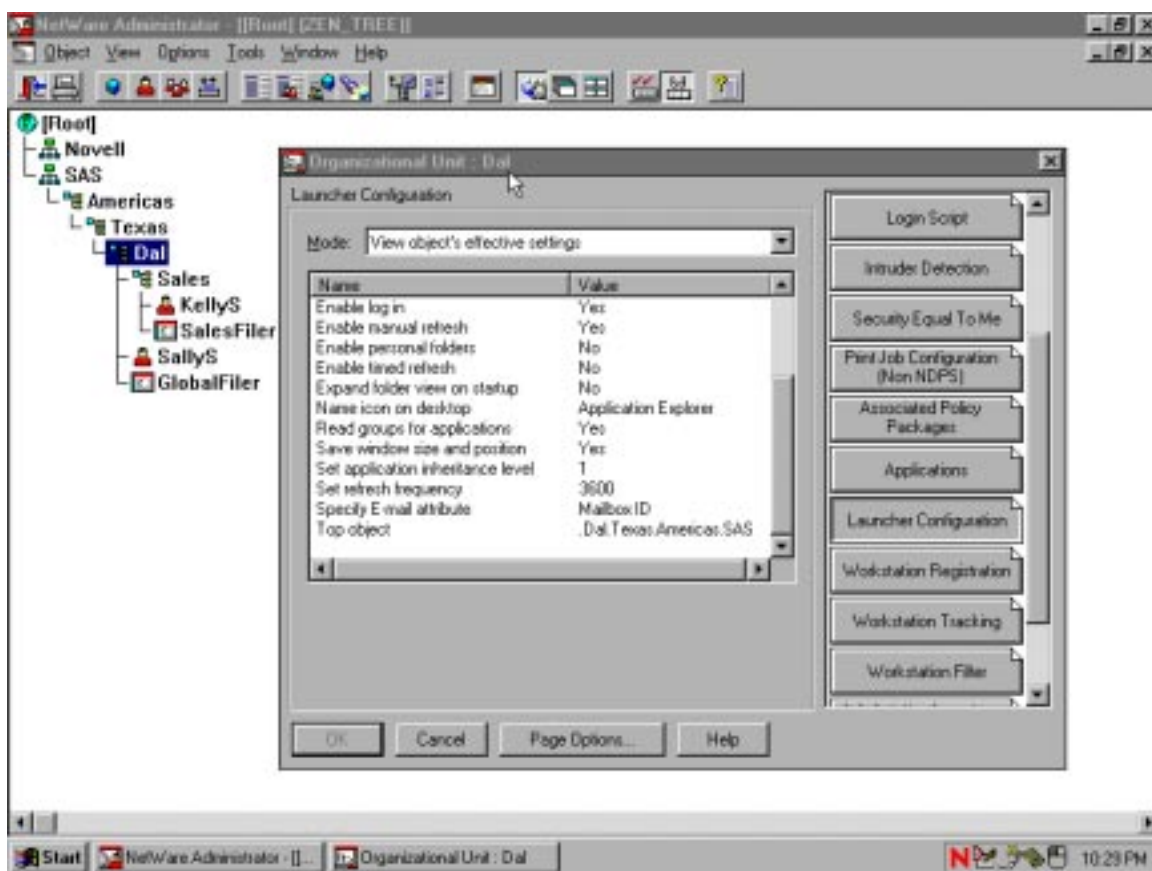


Figure 1

Effectively, then, SALES will also have its “Top object” also set to DAL, due to inheritance.

This “Top object” setting ensures that the users’ Application Launcher does not cross WAN links looking for Application Launcher configuration settings.

**Note:** Having this “Top object” property set to a container across a WAN link can dramatically slow down the loading of the Application Launcher. This “Top object” configuration property needs to be verified and properly set in WAN environments. You would not want to set this at a placeholder container (e.g., Texas or Americas here in Figure 1) because access to it would most likely be across a WAN link.

**Notes on what this property does:**

When the Application Launcher searches the NDS tree for configuration settings, it starts at the lowest possible leaf object (a user or container object) and works up the tree. The Application Launcher continues walking up the tree searching for custom configuration settings until it reaches a container that has been designated as the “top” of the inheritance tree, which is where it stops. If it finds custom configurations in any of the objects along the way, those are the configuration settings that are applied. If it doesn’t find any custom configuration settings, then the configuration is considered “unset” and the default configuration is applied. This method of inheritance lets you control when and where custom configurations are applied instead of the defaults.

(2) Set Application Inheritance Level

Notice in Figure 1 above that the default is “1,” where:

- 0 = Application Launcher won’t look for container-associated application objects
- 1 = Application Launcher looks at the immediate container for container-associated application objects (default)
- 2 = Application Launcher looks at the container up two levels for container-associated application objects
- 3 = Application Launcher looks at the container up three levels for container-associated application objects, etc.
- 1 = Application Launcher looks up to the [Root] for any container-associated application objects. This setting is not recommended in a WAN environment for performance reasons.

**Note:** Use the -1 (search to top of tree) setting sparingly; and only on LAN-only networks.

This Application Launcher configuration property specifies how many parent containers up the NDS tree that the Application Launcher will search for container-associated application objects, not for group- and/or user-associated application objects.

You can ensure that this application inheritance level setting does not walk up the tree across WAN links when looking for container-based associations by ensuring that the “Top object” value (discussed earlier) is properly set.

There are four other settings that should be considered when minimizing WAN traffic. They are:

(1) Enable manual refresh = Yes (default)

If a user hits F5 (Refresh key), the Application Launcher will look for user- and group-based associations up to the [Root] (i.e., across WAN links). However, the Application Launcher will look for container-based associations based on the setting

in “Top object.” There is currently no way to restrict the searching for user-based associations up to [Root] except by eliminating user-based associations altogether. However, you can eliminate the group searching completely by using the following setting.

- (2) Read groups for applications = Yes (default)

Turn this setting off if you are using only container- and/or user-based associations; however, this setting must be left on if you are using group-based associations. There is no way to restrict how far up the tree that the Application Launcher looks for group-based associations so you may want to restrict group associations altogether.

**Note:** Group searching can adversely affect performance if users are member of “global” groups, which are defined as groups who have members in partitions across WAN links.

- (3) Enable timed refresh = No (default)

The recommendation of Novell is to leave this setting at its default of “No,” thus disabling it.

- (4) Set refresh frequency = 3600 (default – this is 1 hour)

This setting is effectively disabled when the “Enable timed refresh” setting above is left at its default of “No.”

## Fault Tolerance / Load Balancing

You can follow the steps defined above for application objects that will be load balanced and/or fault toleranced. You must create a different Application object to reference each server on which an Application is installed. For example, if you have three servers holding applications, create a ZENworks Application object for each program on each server. Use a naming scheme that uniquely identifies each Application leaf object. For example:

<program\_name>\_<server\_name>

Remember that you can name the application as it appears in the NAL window or NAL Explorer window anything that you like.

## Group Objects

Groups are often created to grant users rights to network resources and also to associate them with Application objects. A network administrator can set an object’s Application Launcher Configuration settings to allow or disallow the use of Groups for Application object access (as discussed earlier). If groups are allowed for Application Object access, the Novell Application Launcher (NAL) searches every group of which a User is a member for Application objects. Because of this, it is important for performance reasons to keep Group membership to a minimum and to avoid making a User a member of a Group that spans a WAN link. Like Application objects, Groups should be kept close to the Users when possible.

## Rights to Application Files and Directories

When Application objects are associated with Users, Groups, Containers or Workstations, rights to the application’s files (either the .FIL files used during distribution or any files or directories necessary to run the application) are not automatically granted. Although these rights can be granted to the associated User, Group, Workstation or Container object, it is

usually easier to assign file rights to the application object itself.

**Note:** With ZENworks 2.0, file system rights given to the Application object are immediate. A future release of ZENworks will assign file system rights when the application is launched and subsequently revoke them when the application is exited.

## Application Folder Objects

The Application Folder objects are used only by the network administrators. Users never access an Application Folder object. Therefore, you can place the Application Folder objects in the most convenient location for the administrators. The information in the Application Folder is cached in each of the Application objects that are linked to the Application Folder. This reduces the NDS traffic needed to maintain the Application Folders with their associated applications. For ease of administration, however, we recommend keeping Application Folders with or near the Application objects.

## Designing for Remote Control

### (1) Master Replica Design

**Ideally:** Both the controlling and to-be-controlled machines on the same side of the WAN as the Master replica where the workstation object is stored.

**Optionally:** At least one of the machines on the same side of the WAN as the Master replica where the workstation object is stored.

Rationale for this design:

A cookie is written to NDS for security purposes. The to-be-controlled workstation goes to the Master replica holding its workstation object to see if it can be remote controlled; the controlling workstation also goes to the Master replica holding the to-be-controlled workstation object to read the cookie. To ensure that both workstations accessed the same NDS information, the code was designed so that both workstations communicated with the Master replica.

The next release (ZENworks 5) is moving away from the cookie. For now, to ensure optimal remote control performance, follow one of the two design options listed above.

### (2) Screen Design

<256 colors will give the best performance (goal is to eliminate this with ZENworks 5).

## Rights for Roaming Profiles

If users are using Windows Roaming Profiles, they will need rights to the directories where their profiles are stored. If this is usually the user's home directory additional rights usually don't need to be granted. If the profile is stored in another directory, however, you must make sure the user has sufficient rights. A user with Read and File Scan rights to the directory location containing the profile will be able to download and use that user profile. If Write, Modify and Erase rights are granted then the user can change the user profile and save those changes to the network. When mandatory profiles are used users should only be granted Read and File Scan rights to the directory hold the mandatory profile.

**Note:** Restricting Write, Modify and Erase rights to the profile stored on the server does not



restrict the user from changing the local profile unless mandatory profiles are used.

## **Task 2: Prepare Design Report**

The design report will detail the appropriate method for:

- ZENworks object placement
- Naming standards
- Design steps for minimizing tree walking

**Note:** A design report template is in Appendix G.

## **Task 3: Deliver Design Report to Customer**

For ISO purposes:

- Have the Consulting Business Manager (CBM) review the report first unless you put a “Draft” watermark on it.
- Send it in PDF + password-protected.

# ZENworks Prototype (Lab)

**Note:** The hardware and software in the lab should be set up and ready for you; if not, there may be time/cost overruns and project delays.

For our purposes here, the prototype (lab) is considered to be an implementation step because you will be testing ZENworks by implementing it in the lab.

There are three phases to a ZENworks implementation with the following logic flow:

1. Prototype phase, in which you test and then develop the pilot plan.
2. Pilot phase, in which you deploy the pilot plan to a small test bed of production users and refine the pilot plan (as appropriate) – thus creating the implementation plan.
3. Implementation phase, in which you use the implementation plan to deploy ZENworks to the rest of the company.

Your work order determines which phases you will be doing; however, the key thing is that all three phases must be completed by someone if ZENworks is to be fully deployed in the production environment.

Here's more detail to the above three steps:

**Prototype Phase** can proceed while baseline deficiencies are being “fixed” in production environment; however, your lab should be at a baseline system or at a minimum, the level that the production environment will be in for the pilot and implementation phases.

- Set up the lab to emulate the customer environment (see Appendix A).
- Determine critical success factors in the lab (see Appendix E).
- Use the appropriate “best practices” (later in this section) to help you document the pilot plan, including the appropriate order to implement.
- Test the pilot plan in the lab; document problems / issues.
- Refine the pilot plan.
- Retest the pilot plan in the lab and keep refining until ready for pilot implementation.
- The prototype phase can be considered complete when the critical success factors from Appendix E are all checked-off (validated).

**Pilot Phase** is a limited rollout to a subset of production users; therefore, the production environment must be at a baseline.

- Determine the pilot users; they should be from a fairly technical department and willing to work through any issues with the ZENworks deployment. It is not recommended to use a department containing a lot of executive-level employees for the pilot. Unless specified otherwise, the WOA assumes a pilot will be for 30-50 users (if you will be assisting with the pilot).
- Use the latest pilot plan to come out of your lab testing.
- Document problems / issues discovered in the pilot.
- Retest in the lab (if appropriate).
- Refine the pilot plan which now becomes the implementation plan.

**Implementation** is the full rollout to all users; therefore, the production environment must be

at a baseline.

- Use the latest implementation plan to come out of the pilot.

**Note:** This methodology does not get into full implementation. Therefore, the appropriate step will be to simply give the customer the implementation plan, assuming you did the pilot.

## Task 1: Determine “Best Practice” To Use for Customer’s Environment

Notes:

- This ZENworks implementation section assumes NetWare 4.11 or later. Although ZENworks can function in an NDS tree that includes NetWare 4.10, results may be unpredictable and this configuration is not supported by Novell Technical Services. If you have NetWare NDS servers running versions prior to v4.11 we recommend upgrading before implementing ZENworks.
- Again, the prototype (lab) is where you will be documenting implementation best practices for testing and eventual incorporation into the pilot plan and implementation plan.
- There is no order dependence in these ZENworks implementation tasks (represented by headings) except, of course, that ZENworks must be installed before you can implement any of the ZENworks components. However, within each ZENworks implementation task a best-effort attempt has been made to put steps in the appropriate implementation order. You will need to refine this in the lab, if appropriate.
- The ZENworks Client software can be installed before or after ZENworks software is installed; however, the latest Client software should be running before ZENworks is utilized.

### Installation of ZENworks Software

It is extremely important that your NDS tree is healthy before you install ZENworks and extend the NDS schema to add the additional objects that ZENworks offers.

The following will be performed as part of this engagement:

- NDS Design Review
- NDS Health Check (separate Consulting package) or at a minimum an NDS Health Check “Lite” which includes:

#### (1) Check the NDS Version

Confirm that the latest version of the DS NetWare Loadable Module (NLM) is running on the network servers. Use NDSMGR or DSREPAIR to verify and/or update DS versions. If using DSREPAIR, be sure to run it from a server containing a [Root] replica, preferably the Master.

#### (2) Check NDS Time Synchronization

These are the steps to properly check Time Synchronization:

1. Load DSREPAIR.NLM at server console.  
Ideally, select the server that contains the Master of [Root].

2. From the Available Options menu, select Time Synchronization option.
3. Verify that YES is displayed in the TIME IS field in the SYNC column.

This can also be accomplished using DSDIAG.NLM:

1. From the Check NDS Versions report, press F8 for Display Options.
2. Enable Additional Info. **Timesync Check is an option available from the menu.**

### (3) Check the NDS Schema

You should check the NDS schema on several servers running NDS in the network to verify that all servers are running the same NDS schema. If these servers are not running the same NDS schema, the replica synchronization process may be unable to perform a particular update. For example, suppose that you modified the NDS schema by adding a Job Title property to the user object type and that you then entered a job title for user object John. If a replica containing user object John resided on a server that was running an NDS schema without the Job Title property, the job title you entered would not be replicated to the server.

A server may be running a different NDS schema if an error occurred during the schema synchronization process. When you modify the NDS schema, NDS updates this schema on every server running NDS on the network. As with the replica synchronization process, however, the schema synchronization process cannot replicate updates throughout the network if certain errors occur, such as a server going down.

To check the NDS schema, you use NDS Trace to complete the following steps:

1. At the server console, enter the SET TTF=ON command, which creates the DSTRACE.DBG log file in the server's SYS:\SYSTEM directory.
2. Enter the SET DSTRACE=ON command, which enables NDS Trace.
3. If a DSTRACE.DBG file already exists, enter the SET DSTRACE=\*R command, which prompts NDS Trace to clear the log file. This log file will then contain only new NDS activity.
4. Enter the SET DSTRACE=+SCHEMA command, which enables NDS Trace to display a schema message whenever an update to the NDS schema is synchronized.
5. Enter the SET DSTRACE=\*SS command, which prompts NDS to begin the schema synchronization process for the entire NDS schema.
6. To view NDS Trace messages, press Alt+Esc until the Directory Services screen appears. The message All Processed=Yes indicates that the schema synchronization process was successfully completed. The message All Processed=No indicates that a synchronization error occurred.
7. Press Alt+Esc to return to the server console prompt, and enter the SET TTF=OFF command to save the STRACE.DBG log file to the server's SYS:\SYSTEM directory.
8. Enter the SET DSTRACE=OFF command to disable NDS Trace.

### (4) Check NDS Partition Continuity

To properly check partition continuity, you must do the following:

1. Launch NDS Manager from your workstation

2. From the View menu, select the Partitions and Servers option. This verifies that the servers are able to participate in the replica synchronization process and that the servers are maintaining the same replica ring.
3. A synchronization error is confirmed if an exclamation point (!) appears next to a server's icon. If this occurs, double-click the icon to view a context-sensitive help screen that displays information about the synchronization error.
4. NDS partition continuity can also be checked from the server console by using the NDS Trace feature (part of Novell's SET utility). To perform this test follow these steps:
  - A. Enter the SET DSTRACE=ON command at the server console to initiate NDS Trace.
  - B. To display information on any errors that have occurred during the replica synchronization enter the SET DSTRACE=+S command.
  - C. To enable a signal, or heartbeat, to be transmitted enter the SET DSTRACE=\*H command. The heartbeat is transmitted every 30 minutes by default and prompts each server that holds a replica to begin the synchronization process.
  - D. Press Alt+Esc until the Directory Services screen appears to view the NDS Trace messages. The message All Processed=Yes indicates that the replica synchronization process was successfully completed.
  - E. To disable the NDS Trace, press Alt+Esc to return to the server console prompt, and enter the SET DSTRACE=OFF command.

## Installation of ZENworks Client Software

To use all the features in ZENworks 2.0 and to ensure proper functioning of ZENworks, we recommend that you install the latest client that supports ZENworks. The easiest method for updating client software is Novell's Automatic Client Upgrade (ACU). To use ACU effectively, however, requires a certain amount of consistency in workstation platforms and configurations. To use ACU successfully, we recommend:

### Windows 9x:

- Windows 95 Service Pack 1 or higher (required for proper functioning of Client 32).
- Windows 9x .CAB files stored on local hard disk. The location should be consistent from machine to machine. (This is usually c:\windows\options\cabs.)
- ??? registry entry set to (cab path).
- NDIS LAN drivers instead of ODI drivers.
- Minimum 16 MB disk space available.

### Windows NT 4.0:

- Windows NT Service Pack 3 or higher.
- Windows NT installation files stored on local hard disk. The location should be consistent from machine to machine. (This is usually c:\i386.)
- ??? registry entry set to (cab path).
- Minimum 10 MB disk space available.

### Windows 3.1x:

Although ACU supports Windows 3.1x it is beyond the scope of this guide.

### Using ACU

In order to use ACU, the client software must be copied to one or more servers. Novell recommends copying the client software to all servers to which users map SYS:PUBLIC.

If the client software is copied to the server during the installation of ZENworks, it is placed in SYS:\PUBLIC\CLIENT in the DOSWIN32, WIN95 and WINNT subdirectories. This is the recommended location, since it is not only the default location but also provides the server's users Read and File Scan rights by default.

The installation programs for each operating system within the SYS:\PUBLIC\CLIENT\ directory path are located as follows:

Windows NT – WINNT\I386\SETUPNW.EXE

Windows 95/98 – WIN95\IBM\_ENU\SETUP.EXE

### **Creating a Client Configuration Template**

Included with the client files is a program named NCIMAN.EXE. For Windows 9x it is located in the SYS:\PUBLIC\CLIENT\WIN95\IBM\_ENU\ADMIN subdirectory. For Windows NT it is located in the SYS:\PUBLIC\CLIENT\WINNT\I386\ADMIN subdirectory. This is a GUI utility that allows you to set all desired options for the client install and save them to a text file. The default name and location for this file is SYS:\PUBLIC\CLIENT\WIN95\IBM\_ENU\UNATTEND.TXT for Windows 9x and SYS:\PUBLIC\CLIENT\WINNT\I386\UNATTEND.TXT for Windows NT.

Currently the same version of NCIMAN is used with both Windows 9x and NT. You can use NCIMAN to create either a 95/98 or an NT unattend.txt from either platform. By default, NCIMAN will create an unattend.txt for the OS you are using (either Win 9x or NT). If you want to create an unattend.txt for a different OS just choose File | New file, then select the appropriate OS. When you save the file, make sure you save it in the appropriate directory. To edit an existing file, choose File | Edit file, then select the file you wish to edit. When you save the file it will be saved back to the original directory, overwriting the original version. To save a file using a different file name or directory choose the "Save as..." option.

Run NCIMAN.EXE to set all desired client options, then save the file by clicking on the File menu and choose Save. Normally you would save it as unattend.txt in the ACU setup program directory. For Windows 95/98 the setup program is setup.exe in the sys:\public\client\win95\ibm\_enu subdirectory. For Windows NT it is setupnw.exe is in the sys:\public\client\winnti386 subdirectory.

### **What about Windows Installation (.CAB) Files?**

The Windows .CAB files can also be copied to the client directory, but this creates some problems. For example, if you have multiple revisions of Windows 95 you will need to create multiple Windows 95 client software directories, each with the correct .CAB files for that revision. You will then need to test for the Windows revision level in the login script. A better approach is to ensure that the cab files are kept on each workstation's local hard disk in a consistent location, and that the registry settings that locate the .CAB files are properly set.

### **Running ACU**

Typically ACU is run from a login script. It can also be run using a user or workstation policy package, as a ZENworks application object, as a batch file, or from the command line with the Run command or at a DOS prompt.

To run from a login script, edit the script(s) for the users whose PCs you want to update

(typically the Container login script) and insert the following commands. These commands may vary depending on your configuration and the particular OSES and versions being updated. This example is for multiple OSES:

```
IF OS = "WINNT" THEN
    <path>\i386\setupnw.exe /acu /u:unattend.txt
END

IF OS = "WIN95" THEN
    <path>\ibm_enu\setup.exe /acu /u:unattend.txt
END
```

Note: See TID 2930191 for more information if you are installing it to OSR1 and OSR2 mixed environment.

When the user logs in, setup.exe or setupnw.exe will check the registry for the major and minor version of the client. If the workstation is at the most current client version, the upgrade will not run. These commands can be left in the login script for the next upgrade if you so choose, but they will have some impact on login performance.

### Resources

Before proceeding with ACU please read the following TIDs:

- 2923967, How to Change from ODI to NDIS Driver in W95
- 2932651, Differences between /U, /ACU, /ACU /U
- 2930191, ACU in a mixed Win 95 OSR1 & OSR2 environment
- 2931727, SETUP /ACU hangs with MPREXE-error
- 2939487, ACU Z.E.N. install for multi OS workstations
- 2942026, NetWare 5 Multiple Client Install Login Script
- 2942060, AUTOMATIC CLIENT UPGRADE
- 2942360, How to configure ACU Install Options for 95
- 2942851, Installing Remote Control with 4.6 NT Client
- 2942876, How to create ZEN custom action for NT ACU
- 2942877, NW5 - IP stack corrupted after client install
- 2942904, Installing Remote Control Agent w/ NW5 Client
- 2943427, ACU Step By Step Process with NCIMAN.EXE
- 2952478, NT46SP1 Client for NT Release Notes

**Note:** Thorough testing of the ACU process needs to be done in the lab. [More information on TIDS is located at - http://developer.novell.com/support/](http://developer.novell.com/support/)

## Implementing NAL (Software Distribution)

1. Determine which applications are to be distributed and on which platforms (see Appendix D).
2. Determine which users will get the distributed applications (see Appendix D).
3. Determine if snAppShot needs to be run for each application (see Appendix D). If the application's installation program makes registry settings, changes to INI files, and/or

update configuration files, then snAppShot will be needed. This is commonly referred to as a “complex application.”

**Process:** Refer to the January 1998 AppNote “A Practical Guide to using Novell Application Launcher (NAL) 2.01,” by Sally Specker. Although the section “NAL snAppShot” is slightly outdated, you will find many of the concepts are applicable to ZENworks 2.0.

**Process:** Refer to <http://consulting.novell.com/toolkit/zen.html> which is the NAL and ZENworks Web site posted by Novell Consulting. Refer there to the PDF “Guide to NAL 2.01” by Kevin Prior. Again, much of the snAppShot-specific information there can be applied to ZENworks 2.0. If so, use the snAppShot implementation steps as follows:

## SnAppShot

Novell’s snAppShot is a utility (please consult the Knowledgebase on <http://support.novell.com> for further details) that offers the ability to record what changes are made during the installation of an application or applications. The recorded changes can then be edited and distributed as necessary to other imaged desktops through an automated networked distribution procedure tied in through NDS security.

### Preparing for a snAppShot – Novell Consulting Recommendations

To create a successful snAppShot package, it is recommended to record changes from a base workstation. This base workstation should have only the core operating system, relevant patches, and the appropriate Novell Client installed. The only circumstance where this should be deviated from is in the case where the target workstation group uses the same workstation image (created with Ghost or Power Quest-type utilities).

After any application has been installed on this workstation, re-image the workstation to return it to the original “base” state before another snAppShot is run. This will yield the best results.

### Creating an .AOT (Application Object Template)

An .AOT file is a template, which controls aspects of the application’s behavior such as:

- Registry
- .INI Files
- Text file changes
- Files to be copied
- Application object name and description

The snAppShot utility is used to record modifications made to a workstation during the installation of an application or applications. This utility accomplishes this task through the following three-step procedure:

The first step in the snAppShot procedure is making a “pre-installation” snapshot image prior to installing the application(s). To create this image, the administrator will need to run SNAPSHOT.EXE from the SYS:\PUBLIC\SNAPSHOT directory. This executable file is a wrapper program that will detect what workstation platform it is being executed on and will run the appropriate executable (SNAPPE16.EXE or SNAPPE32.EXE).

The second step turns control over to the administrator who can install one or more applications or make desired modifications to the workstation. Reboots are allowed during the



installation of the applications.

The third step in the snAppShot procedure is to create a “post” installation snapshot image. snAppShot then records the differences between the pre and post snapshot images and records these changes in a snapshot package.

After completing the three steps listed above, the snAppShot process stores three types of information:

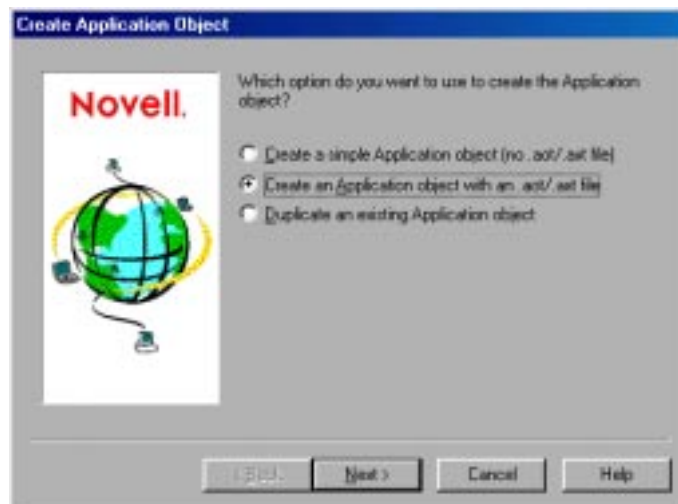
A collection of files updated on the target workstation. During the snapshot procedure, the administrator is asked for a location to store files updated during the snapshot procedure. Any files, which are updated during the installation of the application(s), are stored in this location, but are renamed from their original name to a name including a number and the .FIL extension. For example, if WINWORD.EXE is updated on the target workstation, a copy of this file could be recorded 15.FIL or 27.FIL, etc.

With a list of .FIL files, a control file is also created. This control file is named FILEDEF.TXT. It simply is a text file that allows an administrator to know which .FIL file relates to a particular updated file. For instance, by looking in FILEDEF.TXT, the administrator can determine the .FIL file that was created from WINWORD.EXE. It contains syntax such as: “1.fil=C:\Program Files\Microsoft Office\Office\WINWORD.EXE”.

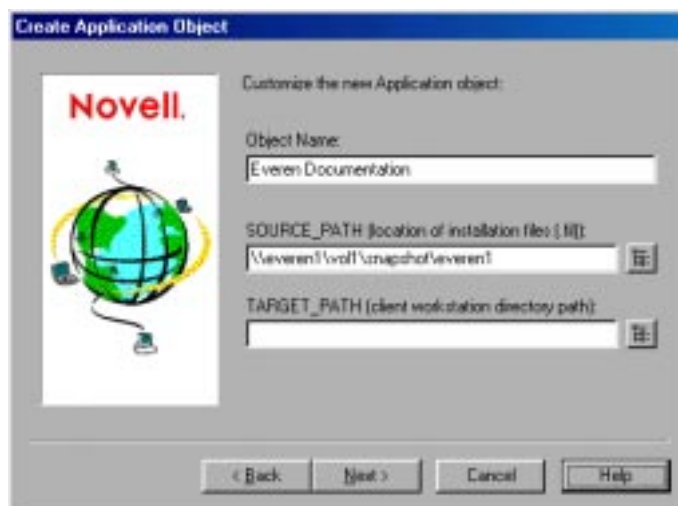
An application object template (.AOT or .AXT) is also created by snAppShot. This file includes information about the workstation changes such as registry changes, .INI file changes, the application object name and description, and any macros defined during the application’s install. The .AOT file contains the same information as the .AXT file with the exception that the .AXT file can be modified using any text editor whereas the .AOT file is in binary format. Conversely, AOT files can be modified by using a current version of NetWare Administrator.

Now that a snapshot package has been created, the administrator will need to create an NDS object based upon the .AOT or .AXT file in order to customize changes recorded during the snAppShot procedure.

To do this, start nwadmn32.exe, navigate to the desired context, and create an application. The following screen is the first screen shown to you. Select the middle option as shown below.



The next few screens will prompt you to provide a path to the .AOT file, an object name and source file path.



The final screen has a checkmark to “display details after completion.” If checked, this will provide you a path to modify an application.

### **Modifying an Application**

Once an application object has been created based upon a .AOT file, the administrator can modify what changes will be made to the application’s recipient workstation(s). This process includes modifying settings contained within tabs of the application object itself. These tabs include macros, registry settings, INI settings, and application files.

Careful inspection of the settings contained within these select tabs can remove unnecessary settings. When looking into the tabs, the administrator will notice that the snAppShot procedure puts every setting and file which is changed on the workstation into a package. This often includes items that do not pertain to the application installation, and which are not necessary to distribute on a “wholesale” approach. These items can include macros, registry settings, INI settings, and even files! For example, common registry settings which are gathered, but should not be distributed may include DHCP address changes, some of the Novell and Microsoft items which are recorded, and DMI hardware notifications just to name a few. Other changes can include files which do not need to be captured such as some DMI, .LOT, and .TMP files.

Through careful inspection and modification of changes recorded by the snAppShot procedure, the administrator can improve the efficiency of a distribution through better use of available bandwidth.

### **Exporting the Application**

Once all of the changes have been made to the application object, the changes must be exported back to the .AOT file. Unless you export the application object back to the .AOT file, none of your customized changes will be made to the .AOT file itself. This will mean that future applications based upon the .AOT file will not include changes made to the initial application object unless the original application object is exported.

To accomplish this, launch nwadmn32.exe, navigate to the desired application object, and select the object. From the Tools menu:

- Select Application Object Tools

- Select Export Application Object



The following screen will be spawned:

If you would like to export certain portions of the changes, you can choose “customize which settings are exported.” This will allow you to select any of the following items to be exported:

- Application object properties
- Registry settings
- INI file settings
- Application files
- Text file changes
- Icons and shortcuts

### **Splitting an AOT**

Within a Windows 95, 98, or NT machine, there exists components of the registry which relate to the local machine and others which relate to the user (current user). As an application is installed, often components are written to both sections. For some of the larger applications, it would be beneficial to have a method to split the application so that the *entire* application does not have to be distributed every time a different user accesses the files. Novell Consulting offers a tool which does just this, and it’s named AOTSPLIT.EXE. Visit - <http://www.novell.com/cool solutions/zenworks/downloadables.html>

AOTSPLIT.EXE is easy to use and will improve the efficiency of how an application can be distributed. This command-line utility when run will split the application into user and machine components. This will allow you to distribute the workstation component once, separate from the user, and the user-component is smaller thus decreasing the time window needed for installation for each user.

To effectively use AOTSPLIT.EXE, work the following procedure:

- Create the .AOT file and base an application on it.
- Clean up the application as much as possible
- Export the application object back to the original .AOT file.
- Run AOTSPLIT against the .AOT. It will create two additional AOT files (one with a

“\_u” appended to the end of the name, and another with a “\_w” appended to it).

Now you can create two applications within NWADMN32.EXE:

- The first can be the workstation application based upon the “\_w” .AOT.  
This can be associated with the workstation(s).
- The second application is the user component application  
Associate this application to the recipient users.

### \*.FIL Files

During the snAppShot process, you will be asked where to store the AOT (application object template) file and the FIL files (FIL files are the individual files associated with an application; they will be numbered 001.FIL, 002.FIL, etc.). Novell Consulting recommends that you establish a standard file system directory structure for storing the AOT file and FIL files for each application. Our recommendation is something similar to:

<volume>:snAppShot\Win31\<appname1>\AOT and FIL's here

<volume>:snAppShot\Win31\<appname2>\AOT and FIL's here

etc.

<volume>:snAppShot\Win9x\<appname1>\AOT and FIL's here

<volume>:snAppShot\Win9x\<appname2>\AOT and FIL's here

etc.

<volume>:snAppShot\WinNT\<appname1>\AOT and FIL's here

<volume>:snAppShot\WinNT\<appname2>\AOT and FIL's here

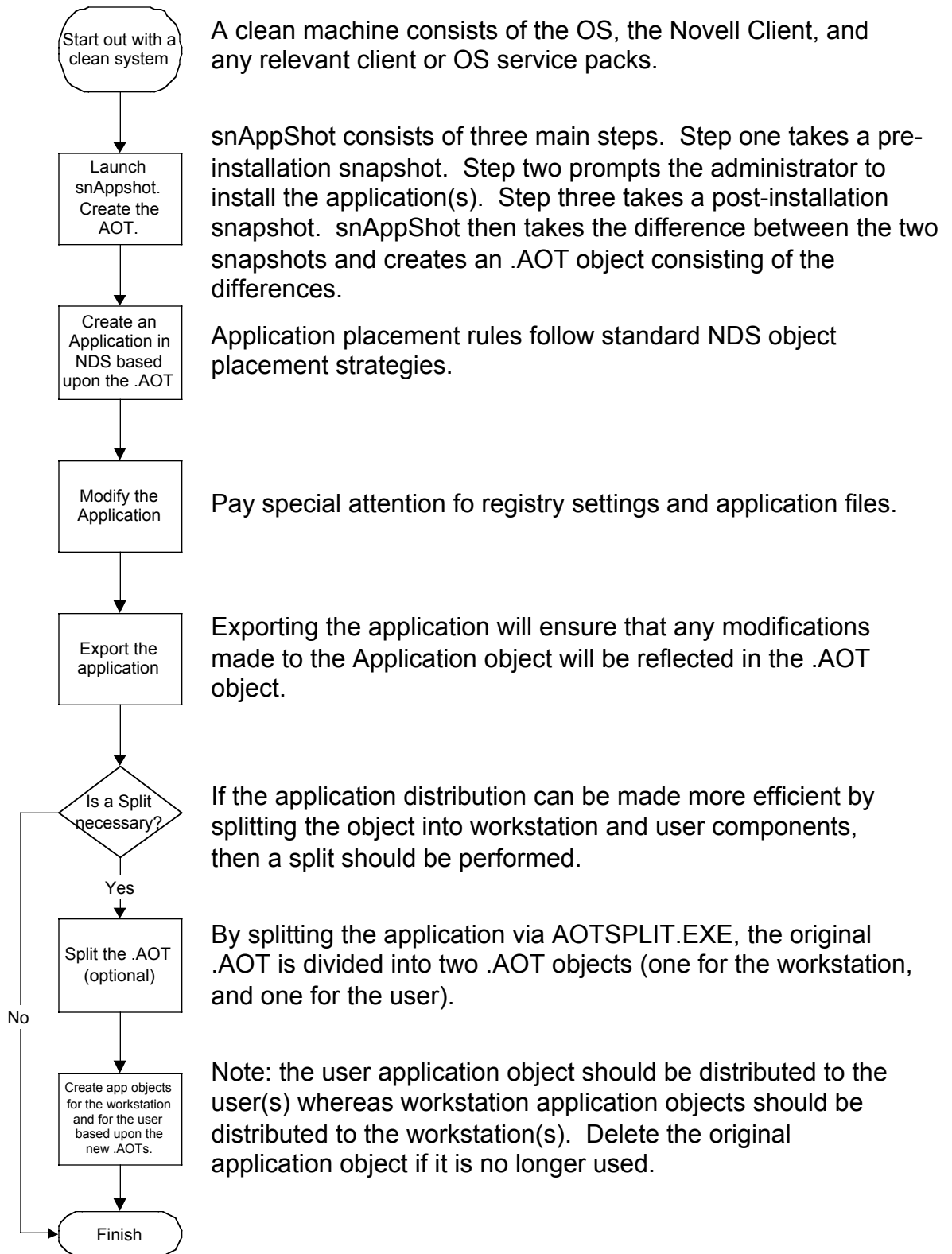
etc.

\*Note Using mapped drive instead of unc paths during the SnAppShot process allows you to copy your app objects to other servers and other app objects in your tree without changing all your macros in the app object.

In these examples <volume> should be a NetWare volume other than SYS (if possible) since the FIL files for each application can consume a lot of disk space. A directory structure such as this also facilitates using NRS (Novell Replication Services) to replicate these application files to other servers. ZENworks 2.0 does not support server-to-server software distribution, but this will be possible with the ZENworks for Servers product.

**Note:** Refer to the October 1998 AppNote “A Z.E.N.works-Friendly Location Independence Strategy for NetWare Networks” by Timothy Forde. This article offers a solution to ensure that users access NAL files (vs. NDS objects) from the closest server.

## Summary snAppShot Flowchart



## NAL Considerations:

(1) Do any of the application's settings need to be "variable" for each user? (For example: path to a subdirectory on the user's personal home directory, proxy server IP address for a group of users, etc.) If so, use NDS variables and NAL Macros for customization.

**Process:** Refer to the Netscape example in the ZENworks course (referenced in the Training Curriculum section at the beginning of this consultant guide). There should also be examples for using macros on the ZENworks Cool Solutions web site (again referenced in the Training Curriculum section at the beginning of this consultant guide).

If no customized settings are necessary, you can run snAppShot entering generic information during the application's installation process. This generic information will then be distributed to all users.

(2) If you want to ensure that a user only runs an application from within NAL, do not scan for Windows shortcuts (this is the default) during the snAppShot process. This is especially important if Software Metering with NAL will also be used.

4. Create and name application objects in the tree (see ZENworks Design section). Use the AOT file created from snAppShot (where appropriate).
5. Set Application Launcher configuration properties to minimize WAN traffic (see ZENworks Design section).
6. Set application object properties.

(1) Set and/or verify required application object properties.

Required properties are properties that should always be set and/or verified, especially for troubleshooting purposes. They include:

- *Identification, Path to executable file.* If a drive mapping is used here (vs. UNC), the user must also have that drive mapping or the distribution/execution will fail.
- *System Requirements, Operating System.* Ensure the appropriate platform to be distributed is set here. If not, the users will not see the applications in the Application Launcher.
- *Associations.* Must be set or the users will not see the applications in the Application Launcher.
- *File Rights.* Must be given either here, through NWAdmin, or through command line utilities. Our recommendation would be to assign file rights to the NAL object, which could possibly eliminate the need for groups for this purpose.

(2) Consider optional properties, which enhance the functionality of NAL.

- Refer to the January 1998 AppNote "A Practical Guide to using Novell Application Launcher (NAL) 2.01," by Sally Specker. Although the section "Application Object Properties" is slightly outdated, you will find many of the properties discussed are applicable to ZENworks 2.0.
- Refer to <http://consulting.novell.com/toolkit/zen.html> which is the NAL and ZENworks Web site posted by Novell Consulting. Refer there to the PDF "Guide to NAL 2.01" by Kevin Prior. Again, much of the snAppShot-specific information there can be applied to ZENworks 2.0.

7. Determine which Application Launcher to use. There are two user components with NAL:

- (1) The NAL Window (NAL.EXE)
- (2) The NAL Explorer Window (NALEXPLD.EXE)

The decision regarding which one to use is based upon:

- (1) The operating system in use:
  - Windows 3.x and Windows NT 3.51 can only use NAL.EXE
  - Windows 95/98 and Windows NT 4.0 can use NAL.EXE or NALEXPLD.EXE
- (2) Whether or not the Application Launcher Window will replace the user's shell:

| NALEXPLD.EXE                 | NAL.EXE    |
|------------------------------|------------|
| Can I replace the shell?     | No*    Yes |
| Can I enhance the shell?     | Yes    No  |
| Can I show all local apps?   | No**   Yes |
| Can I show personal folders? | Yes    Yes |

\* If Windows Explorer.exe is run this now becomes the shell.

\*\* You can enable the Start Menu in the NAL Window or NAL Explorer Window.

- (3) User and/or administrator preference

The NAL Window has a Windows 3.1 feel since applications are only displayed in a window. In contrast, the NAL Explorer Window can display applications in either a window, the Start Menu, the Desktop, or the System Tray (or any combination of these).

If using a Windows 95/98 or Windows NT environment, many users will not appreciate being put back into a Windows 3.1-type of interface (NAL.EXE). In this case the NAL Explorer Window (NALEXPLD.EXE) would be the appropriate choice.

8. Associate application objects (see ZENworks Design section).
9. Test application distribution and refine process as necessary.

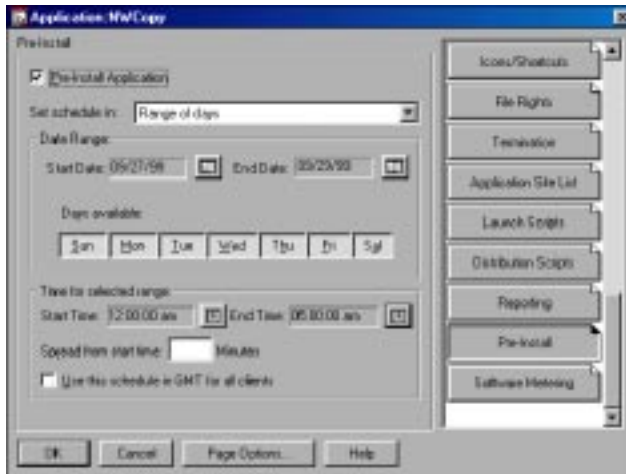
## Pre-Installation or "Lights Out" Software Distribution

New in ZENworks 2.0 is the NAL Workstation Association Agent. It is auto-installed when you run the ZENworks 2.0 version of NAL.EXE or NALEXPLD.EXE. Once installed, it will always be running every time you start the workstation (before user login). You can see if the NAL Workstation Association Agent is running through the Novell Desktop Management Scheduler (in the Windows System Tray). The NAL Workstation Association Agent is the mechanism to do "lights out" distribution for workstation-associated applications where the user does not have to be logged in.

It is the Pre-Install property page of an Application object that is used to set up a lights-out distribution of an application. You can set up the distribution to take place after hours according to a pre-defined schedule. This will save considerable time when users log in

because they no longer have to wait for all of the distribution processes to run.

Pre-Install will perform the entire distribution process (file copying, modifying text files, .INI files, and registry settings in HKLM); when the users logs in and accesses the application



object for the first time, only the remaining user-specific settings (HKLU registry settings) will be modified on-the-fly, and the application will be launched.

For a true lights out distribution (where the user does not have to be logged) you must associate the application object to the workstation object. For user-associated applications, the user must be logged in and Application Launcher or Explorer must be running (not truly a lights out distribution).

As with any Application object associated with a workstation, an Application object with Pre-Install turned on that is associated with a Workstation object will only install and run if the workstation is properly registered. The workstation must also have appropriate rights to the installation files (usually Read and File Scan) in order for the Application to install.

**Important:** With NT workstations, if a user is not logged in, the user-specific macros will point to the default user directories. This scenario affects the ability to place folders and icons on the Start menu. There are two ways to solve this issue:

- Mark the macro entries in the Application object as Track Distribution Per User.
- Change the user-specific macro to an All Users macro (i.e., %\*PROGRAMS% to %\*COMMONPROGRAMS%).

### Pre-Install Application

Check this box to turn the Pre-Install option on. The default setting is off.

#### Set Schedule In:

You can set the Pre-Install to run on a range of days, or on specified days and during a specified time range. If pre-install is turned on and no schedule is set the application will pre-install as soon it is available to the associated user or workstation. These are the same parameters as you see on the Schedule property page, and operate identically.

All of the System Requirements that are applied to an application object, including file existence, version or date, existence of a registry setting or existence of an environment variable, apply to pre-install.



The time zone that the workstation is in determines when the application is distributed. The Novell Desktop Management Scheduler “pulls” the time from the Application object.

## Determining Users Associated to Applications

You can generate a listing of users and the applications associated to them, either directly associated to their user ID, group, or container as follows:

- 1) Use OExport and export either the App:Association attribute of all user, group and container objects (this will show it from the users) or the App:Backlink attribute of all applications to see all users associated with applications.
- 2) Use Nlist as follows:

```
NLIST USER SHOW APP:ASSOCIATIONS.
```

If you want to view the objects associated with an Application you can type Nlist App:Application show “App:back link”. Don’t forget the quotes around “App:Back Link” (due to the space in back link).

- 3) Use the “Show Inherited Applications” option in NWAdmin.

## Workstation Registration

In order to use the policies within a Workstation Policy Package object, workstation objects must be imported (“created”) into the NDS Tree. This task is done with a Workstation Import Policy (within a User Policy Package object).

### (1) Grant User Rights to Register Workstations in Container(s)

Before the workstation registers to the user’s container, you need to prepare the NDS container. During the installation of ZENworks, the default is to prepare workstation registration from the [Root] container down. After the ZENworks installation, you can prepare a container for workstation registration by either:

- Running WSRIGHTS.EXE
- Using NetWare Administrator (NWAdmn32), highlight a container and then choose Tools > Workstation Utilities > Prepare Workstation Registration

If you create a new OU, this registration must be performed on that container before the workstations can be imported. An NWAdmin dialog “help” box will alert you when workstation registration is needed in a container.

### (2) Determine Naming Standards for the User Policy Package Object

See ZENworks Design section.

### (3) Create a User Policy Package Object in the Tree

See ZENworks Design section.

### (4) Set Naming Standards for Workstation Objects within the Workstation Import policy

See ZENworks Design section.

## **(5) Set Where the Workstation Objects will be created within the Workstation Import policy**

See ZENworks Design section.

## **(6) The Workstation Registration Process**

This is a three-step process:

(1) The Workstation Agent is run; this can happen in the following three ways:

(a) Users log on to the network with a ZENworks Client. This occurs when the Desktop Manager is set to automatically run WSREG.DLL at login time. Note that this is the default.

(b) Place WSREG16.EXE (for Windows 3.1) or WSREG32.EXE (for Windows 95-98 or Windows NT) in a login script. This method is generally used if users will not have the Desktop Manager component of ZENworks enabled.

© Use the sample NAL object WReg16 for Windows 3.1 or WReg32 for Windows 95-98 and Windows NT. This method is generally used if users will not have the Desktop Manager component of ZENworks enabled.

(2) Import workstations into the NDS tree

(a) Manually

Choose the Import Workstations option within the NWAdmn32 Tools menu; imports all workstations.

You can selectively import workstations by selecting workstation entries on the Workstation Registration page of a container; you can selectively import workstations:

```
Z:\public\wsimport.exe "users.org" /s-
```

(b) Automatically

If you use Desktop Management features, you can schedule the Import process by creating a scheduled action for WSIMPORT.EXE.

The scheduled action should include the .exe name, the context of the container you want to import to, and any command line parameters you might want to use.

For example, if your context were USERS.ORG and you didn't want to include subcontainers in the import session you were creating the scheduled action for, you might enter the following as your scheduled action target:

```
Z:\public\wsimport.exe "users.org" /s-
```

### **Troubleshooting**

<Right-Click> on the Novell Desktop Management icon in the Window System tray; "Display NDS Information"; the Workstation Object field should be populated with the appropriate information.

After the workstation registration agent runs, at the root of the workstation's first local drive (most cases C:), a WSREG32.LOG file will be created. This file shows what the workstation registration agent did. If errors or problems occur, look at the WSREG32.LOG file to determine why a workstation didn't register or to determine why certain Workstation object attributes are not being updated correctly. Under Windows 3.1, WSREG16.EXE creates the WSREG16.LOG file.

Sometimes a workstation fails to register properly [in Step (1)] because it has already been registered in another tree. To unregister a workstation, run UNREG16.EXE or UNREG32.EXE. This will clear out the "old" information in the registry under HKLM/Software/Novell/Workstation Manager/Identification. You will not be able to import a workstation until the registration in Step (1) has been completed properly.

(3) Allow workstations to re-register in the NDS tree.

This third and last step serves two purposes: getting the physical workstation associated to the newly created Workstation object in the tree and keeping the Workstation object attributes updated with some changes to the workstation.

To complete the last step and associate the physical workstation with a Workstation object in the tree, the WSREG.DLL (Win32) or WSREG16.EXE (Win3.1/DOS) must run a second time after an importation has been completed. How you registered in Step (1) above determines how you will finish this last step.

## Policies

Deploying a consistent desktop "appearance" is part of creating a standard desktop for users. With the Desktop Preferences policy within a User Policy Package object, you can define standards for a common color scheme, wallpaper, screen saver, sound options, etc.

Desktop Preferences are available for Windows 95-98 and Windows NT. They are not supported for Windows 3.1.

## Inventory

### Software

Notes / Gotcha's / Tips:

- >50 workstations = use a site database (per IS&T, Tim Crabb). Problem rolling up database; this will be resolved in ZENworks 5.
- Max of 10,000 objects in the Sybase database; optimal = 5,000; IS&T = 3-5,000. Most customers do 2-5,000 real world per site.
- Draw the Triangle and put into the Meth; no IPX support for Java is the reasoning that need IP.
- Still reads the LDAPPL.INI file. Unlike ManageWise, do not manually edit the LDAPPL.INI file.
- Sybase doesn't support multiprocessors. Can install on NetWare 5 (MPK) but not on NetWare 4 (SMP).

The max size of the Sybase database in ZENworks 2.0 is 2 GB and that's what limits how many workstations can be inventoried. Another important factor becomes what information is

being collected. A ZENworks Sybase database can hold about 20,000 workstations if hardwareinfo only is being collected, but only about 5,000 workstations if hardware, software, and DMI information.

This guide provides information for planning ZENworks inventory deployment in organizations and networks. ZENworks inventory is targeted at network sizes in the mid-size (100-1,000 nodes) PC LAN and WAN environment and large size PC LAN environments. This guide discusses scenarios addressing the configuration of inventory over networks.

## **Overview of Inventory Database and Server Components**

ZENworks inventory uses the following independent components for inventory scanning at workstations:

- **Inventory Scan Programs**

Platform-dependent scan programs that determine the hardware and software configurations of workstations. These scan programs are located on the ZENworks server, when executed on the workstations collect the inventory information of the workstations.

- **Inventory Gatherer**

A NetWare Loadable Module (NLMTM) on the inventory server that collates the hardware and software information, which is sent by the inventory scan programs. The scan information is stored as temporary files with a .STR extension.

- **Inventory Storer**

A Java-based component on the inventory server that stores the collected inventory information (.STR files) from the Inventory Gatherer to the inventory database.

- **Inventory Database**

A database that functions as a repository of workstation hardware and software information. In ZENworks 2, the database is a Relational Database Management System (RDBMS) maintained in Sybase on a NetWare server.

- **Console**

A Windows-based snapin to the ZENworks Console, NetWare Administrator. This snapin executes a Windows program that checks for Java Runtime Environment (JRE), and executes the requested Java program, which accesses the database.

You use the Console to access the information.

The Inventory Gatherer and Inventory Storer are located on the same NetWare server, referred to as the Inventory Server. The ZENworks install program configures the ZENworks server as the inventory server, by default.

The NetWare server that contains the ZENworks inventory database is referred to as the Inventory Database Server.

ZENworks inventory allows the flexibility of configuring the server as both inventory server and the database server. Based on the inventory configurations that you deploy, multiple inventory servers can connect to the same inventory database server.

For configuring the inventory scanning, we recommend the following:

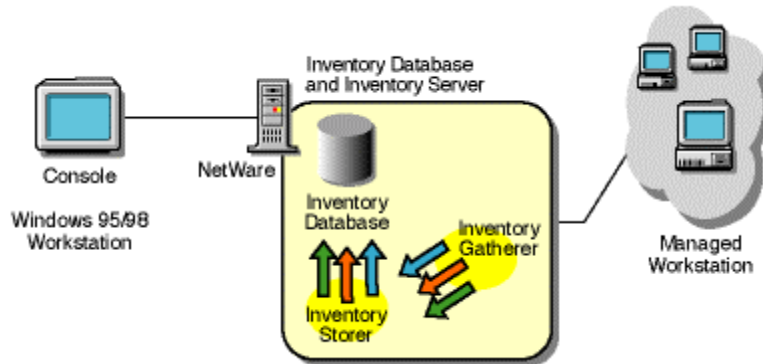
Staggering the inventory scanning of workstations at different times on the managed workstations, specifically on WAN environments. Choosing the nearest inventory server, when configuring the inventory server in the Workstation Policy.

## Possible Configurations of the Inventory Server and Database Server

The following scenarios depict inventory deployment over varying network sizes.

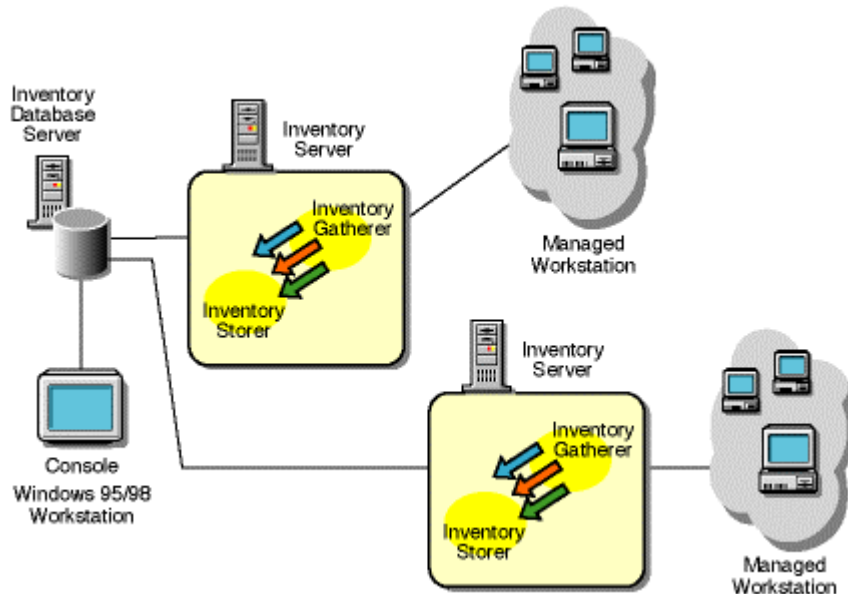
### Configuration 1: Central Inventory Server

In this type of inventory configuration, the inventory server components and database are located on a central NetWare server.



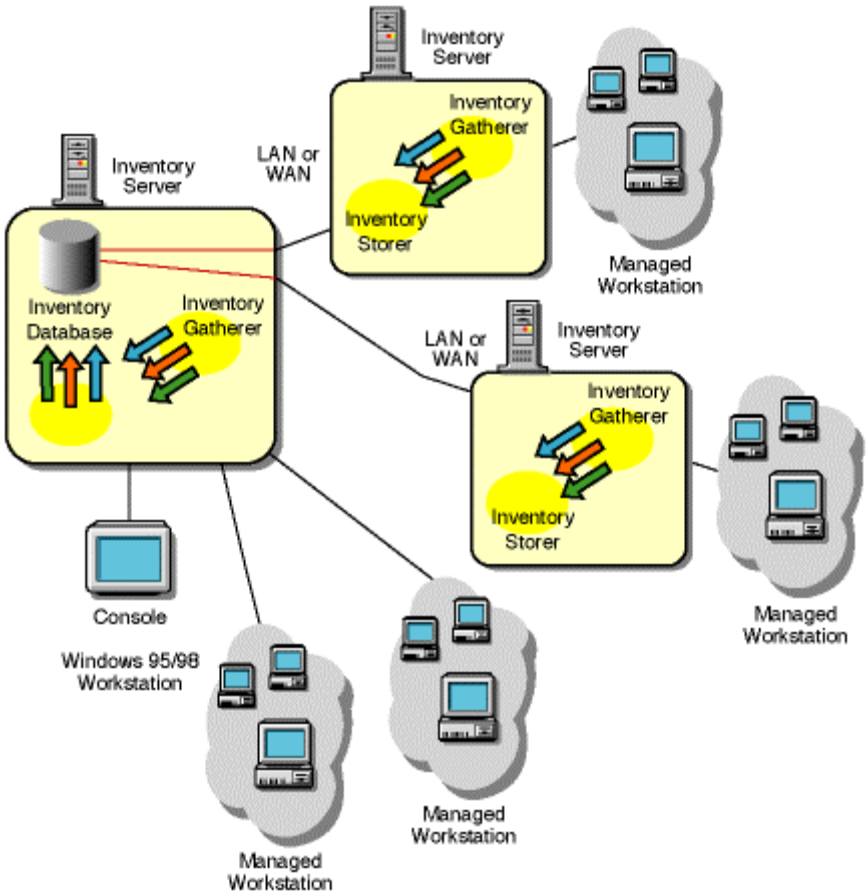
### Configuration 2: Multiple Inventory Servers and a Single Database Server

In this type of inventory configuration, there are multiple inventory servers. These inventory servers are connected to one inventory database server.



Configuration 3: Multiple Inventory Servers and a Single Inventory Database-Cum-Inventory Server

In this type of inventory configuration, one or more inventory server components are connected to the inventory database, which is also an inventory server.



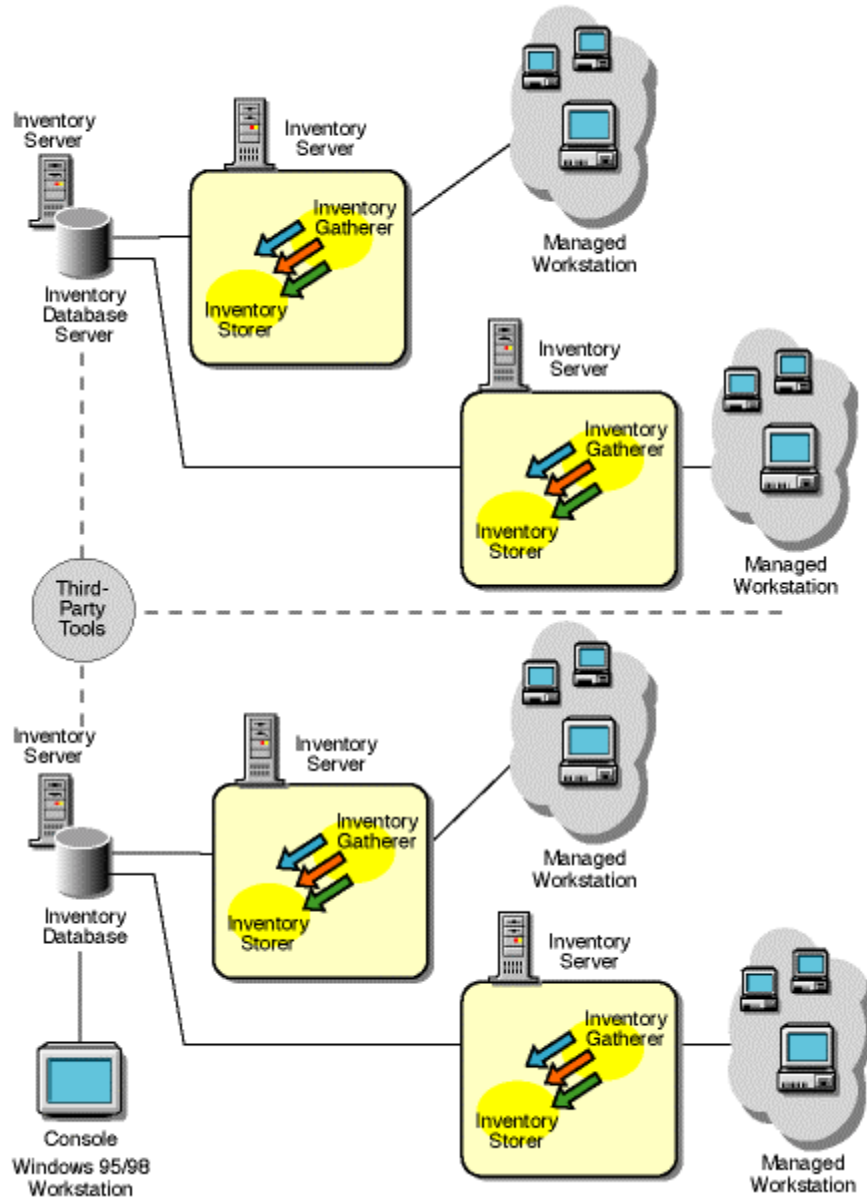
#### Configuration 4: Multiple Inventory Configurations

In this type of inventory configuration, the organization has multiple inventory servers and database servers. Multiple database servers will not share the inventory data across multiple inventory deployments.

The inventory reports that you generate will pertain to a single inventory database only. If you want to consolidate multiple database information, follow any one of these methods:

From the NetWare Administrator Console, connect to a single database. Use the ZENworks Reporting Tool to export data from each database in the available report format, such as a Comma Separated Value report. You can then merge the database information into any database or third-party merge tool.

Use third-party Java Database Connectivity (JDBC) or Open Database Connectivity (ODBC) tools to generate the database applications, which read data from the various databases.





## Deployment of Inventory in a LAN Environment

The following scenarios are addressed in this section:

Scenario 1: LAN Environment with as many as 3,000 Workstations

Scenario 2: LAN Environment with between 3,000 to 10,000 Workstations

Scenario 3: LAN Environment with more than 10,000 Workstations

**IMPORTANT:** The recommendations in the discussed scenarios are generic, due to the unique nature of the topology further refinements may become necessary.

**NOTE:** In a LAN or WAN environment, you must take into account the following guidelines for deploying inventory:

There can be a lot of bursty input/output operations on the server. If the user has deployed the same server for some other services such as Novell Distributed Print Services (NDPS) or other applications, it may lock the server. To troubleshoot these server related problems, refer to the NetWare documentation to fine tune the server.

The optimal database cache size requirement for the server may vary as it depends on the server environment.

Determine the database cache size that needs to be set by trying a range of cache sizes in the runtime environment.

Scenario 1: LAN Environment with as many as 3,000 Workstations

In this scenario, the recommended deployment is illustrated Configuration 1: Central Inventory Server

### Recommendations for Deployment

Minimum base server configuration should be 64 MB RAM and a database cache of 16 MB. For a 3,000-workstation range, the server configuration is 256 MB RAM and a database cache of 64 MB.

Staggering of scans can be achieved easily because transferring the inventory scan data to the Inventory Gatherer is likely to take a few seconds. However, staggering should be done to the extent possible.

Scenario 2: LAN Environment with between 3,000 to 10,000 Workstations

In this scenario, the typical inventory deployment is illustrated Configuration 2: Multiple Inventory Servers and a Single Database Server

### Recommendations for Deployment

Minimum base server configuration includes 256 MB RAM and a database cache of 64 MB. For a higher workstation range, the server configuration is 512 MB RAM and a database cache of 128 MB.

All workstations should send the scan data to the inventory server that is the nearest server and on the LAN: policies must be created based on this information. To achieve this for 10,000

workstations, three or four inventory servers per inventory database server should be sufficient.

The transmission of scan data from inventory servers can take several hours or even longer than a day. Workstation scanning is an on-going background process, which continues until there is data to upload without any user intervention.

**IMPORTANT:** The last scan date reflects the time of the scan in the minimal information stored in the NDS Workstation object. This information is also displayed while querying the inventory database from the Console. It is possible that the database update is in process while the minimal information in the Workstation object is already updated.

### Scenario 3: LAN Environment with more than 10,000 Workstations

#### Recommendations for Deployment

In this scenario, a single inventory database is not sufficient to handle the large volume of scan information: database operations may slow down.

Also, inventorying this many workstations might span several geographic locations; some of these locations may have a similar configuration as described in Configuration 1: Central Inventory Server with as many as 3,000 Workstations or Configuration 2: Multiple Inventory Servers and a Single Database Server. These workstations need to be managed primarily at a geographical level. Though for other enterprise level inventory management, the data needs to be merged from all locations.

In this scenario, the typical inventory deployment is illustrated in Configuration 4: Multiple Inventory Configurations.

The database must be installed at those logical levels of the organization, where the management and inventory reporting tasks can be done.

The ZENworks Reporting Tool provides an option to export the data from a report into any format. You can collate the data from multiple databases into the format you prefer and import into an appropriate reporting tool.

For querying the inventory database from the Console, a single database only should be connected and queried at a time. Usually, the network administrator from the Console connects to a local database. If a remote database is selected for querying, the results of the inventory query, inventory summary, and all operations will execute at a proportionately slower speed. Furthermore, there are no timeout configurations and these inventory operations will display results.

#### Deployment of Inventory in a WAN Environment

The following scenarios are addressed in this section:

Scenario 1: Single User Connecting on a WAN or Dial-Up

Scenario 2: Small Office with between 5 to 100 PCs

Scenario 3: Medium Office with between 100 and 3,000 PCs

Scenario 4: Large Locations with more than 3,000 PCs

Scenario 1: Single User Connecting on a WAN or Dial-Up

In this type of inventory deployment, the scan programs transmit information to the Inventory Gatherer over a WAN or dial-up.

#### Recommendations for Deployment

The Inventory Gatherer has a transfer timeout at two minutes. In case of large Desktop Management Interface (DMI) scan information over slow links, the Inventory Gatherer may time out and not receive the scan.

**IMPORTANT:** ZENworks inventory does not support Serial Dial-up. If SLIP or other IP/IPXTM service is available and configured, and the user at the managed workstation has logged in to NDSTM, this service will work. However, it will be linked by the speed of the link. The scan upload time should be below two minutes for the inventory scan to work.

#### Scenario 2: Small Office with between 5 to 100 PCs

##### Recommendations for Deployment

The minimum requirement is an inventory server; the database can be at a central location. In this scenario, the database connection between the Inventory Storer and the Sybase database server with JDBC is over a WAN.

The time required to upload data to the database is likely to be high and limited by the WAN speed. Using a single server, the database write operation time (the time the Inventory Storer takes to place the temporary .STR files into the database) can be more than a minute per workstation scanned; large scans, such as Desktop Management Interface (DMI) 2 enabled workstations, can generate files as large as 100 KB.

On a WAN environment, the time taken for database operations is longer. There may be a significant time lapse before you can view the inventory query information after the scanning information is available.

Because there are NDS objects on a WAN, design of the NDS tree and the inventory-related objects, User objects and User Policies must be planned. Planning should be as per NDS tree design recommendations.

All inventory policies and Workstation objects should be in the local partition. A local read/write replica must exist on the geographical location. If possible you should prevent the inventory components, such as the scan programs and the Scheduler, from having to access the WAN to read the Workstation Policies.

If the objects are accessed over a WAN, such as scanning mobile user's workstations, scanning should still work, although with the slower performance.

#### Scenario 3: Medium Office with between 100 and 3,000 PCs

##### Recommendations for Deployment

In this type of inventory deployment, each location must have a local database. The database generates local inventory reports and some local management, without accessing the WAN for the local data. This type of inventory configuration is similar to inventory installations in a LAN environment.

For creating enterprise level inventory reports, data can be distributed after database exports. If the central database in the enterprise is below 10,000 workstations, you can also manually import this data into the same database.

Manual backing up of files is advisable only if you are familiar with the specific details of inventory implementation.

An alternative approach is to export the data using the ZENworks™ Reporting Tool for all the databases and then later import the data into third-party reporting tools. You can then limit the volume of data to relevant useful data only.

#### Scenario 4: Large Locations with more than 3,000 PCs

The inventory deployment is similar to Scenario 3: Medium Office with between 100 and 3,000 PCs. In this scenario, there are multiple databases in the inventory locations.

#### Recommendations for Deployment

Merging of the data at the enterprise level is a complex task.

To merge all the data, collect all the relevant data from each database and use an appropriate reporting tool.

#### Using an Optimal Database Cache Size on the Inventory Database Server to Improve the Performance

Improving the database cache size improves database performance.

The default database cache size is 16 MB. This database cache size is not adequate for large databases with more than 3,000 workstations.

You should change the database cache size to an optimum size. We recommend a database cache size that is one-fourth of the database size. For a database with around 3,000 workstations stored in it, the recommended cache size should be 64 MB.

To change the database cache size

1. Close all the connections to the database.
2. Quit the Sybase server.
3. Open the SYBASE.NCF file located in ZENWORKS\DATABASE.
4. Modify the -c parameter:  
  
-c 64M
5. Save the file.
6. On the network console, invoke the inventory database. Type:

SYBASE

NOTE: We recommend the memory on the database server should be more than 64 MB of memory.

The higher the database cache size, the less memory is available for other modules. If you use a larger cache size, for example more than 48 MB cache size in 64MB total memory, you may encounter out of memory problems. Use a maximum 50% of the total memory as the database

cache size.

On a NetWare 4.x server configured as a database server, with 64 MB RAM base server memory, the database cache should be lesser than 16 MB (8 MB is recommended). Sybase takes up certain amount of cache memory at startup and also additional amount of memory at runtime for the database operations. In such cases, the additional memory amounts to 16 MB.

If the server has additional software installed on it, the database cache should be decreased. We recommend that the database cache should be 8 MB. However the performance may degrade with lower cache sizes. Hence it is required to choose an optimum cache size. The optimum database cache will always depend on the physical memory and other NetWare Loadable Modules (NLMTM) loaded on the server. While choosing an optimal value for the cache size, you must remember that increasing the database cache size will impact the server software; software such as the NLMs will have less memory or almost no memory and may abend the server

### Configuring Multiple Inventory Servers and a Single Database Server

In the default configuration, the inventory database is configured on the same server where ZENworks™ is installed. However, the administrator can choose to install ZENworks on multiple servers with the database on another server under a tree. In this case, each inventory server will have the Inventory Gatherer and Inventory Storer components. The Inventory Gatherer accepts the scan data of the workstations attached to it and creates .STR files. The Inventory Storer stores the .STR files in the remote inventory database. The Inventory Storer on the inventory server point transmits to the single database server.

You can configure the database server during the ZENworks installation. Enable the Install Database check box and select the server. The Inventory Storer file, STORER.NCF located in \PUBLIC\ZENWORKS\JAVA on each inventory server, connecting to the selected database server will be modified to reflect the change in the database server. The IP address of the database server is specified in the -dbloc parameter of the STORER.NCF file. This parameter can be manually modified to redirect the Storer to a different database server even after installation.

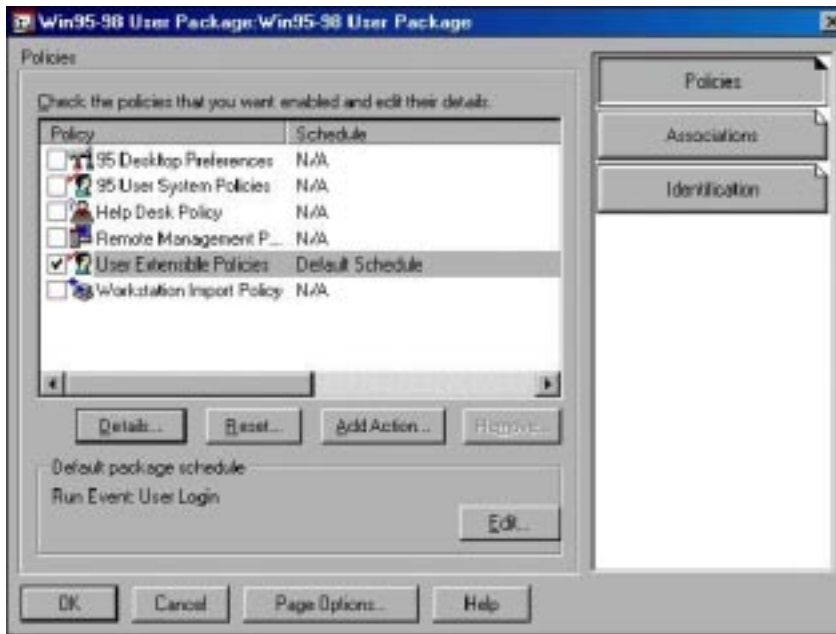
For multiple database configurations, execute the complete install again for each database server.

## Extensible Policies (ADM Files)

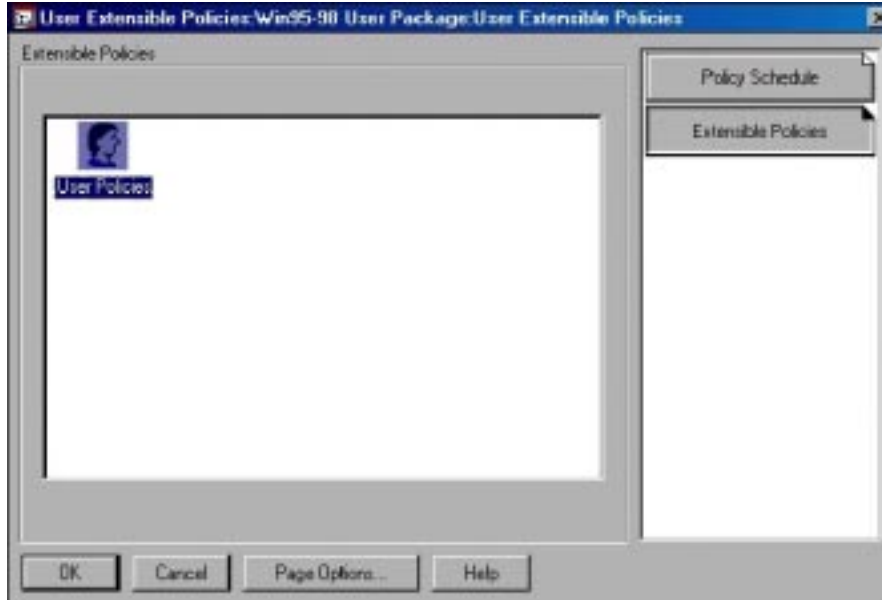
Notes / Gotcha's:

- You cannot control which group-associated policy runs first (assuming multiple group-associated policies are being used).

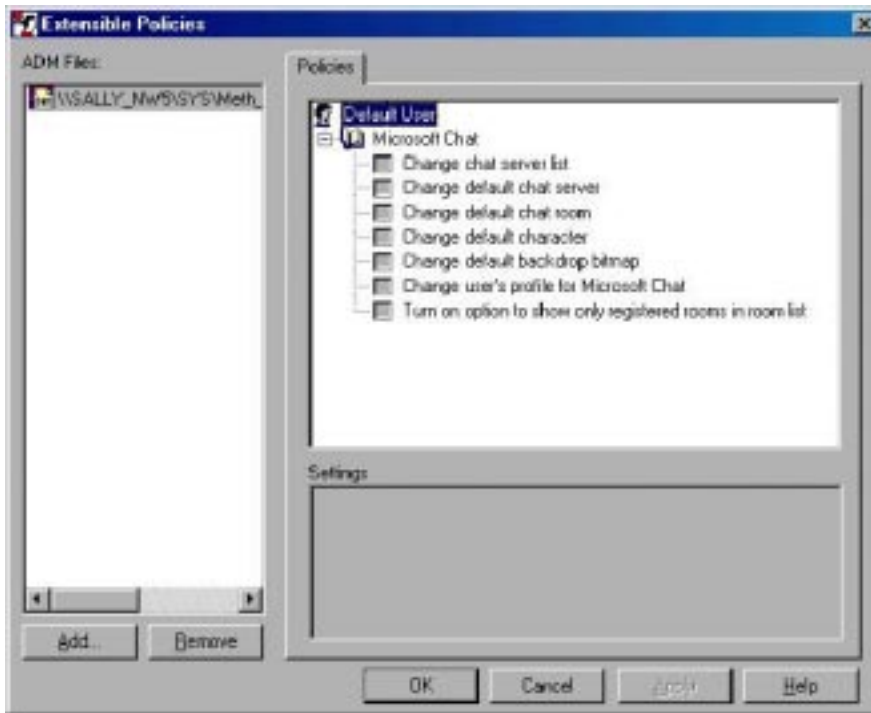
ZENworks 2 enables you to add .ADM files to ZENworks User or Workstation Policy packages, allowing you to distribute and apply new Windows policies to users or workstations. Microsoft uses .ADM files to define Windows desktop policies. The standard way to apply policies to a workstation is to use Microsoft's policy editor (POLEDIT.EXE) to read the .ADM files and create a .POL file that updates the workstation's Windows registry.



.ADM files are imported into NDS using NWAdmin. In the Policy Package details, check User or Computer Extensible Policies, click the “Details” button, then click on the “Extensible Policies” button on the next screen. Double-click on the “User Policies” or “Computer Policies” icon.



To add an .ADM file, click on the “Add” button, then use the browser Window to select an .ADM file. (.ADM files should be stored on a server drive.)



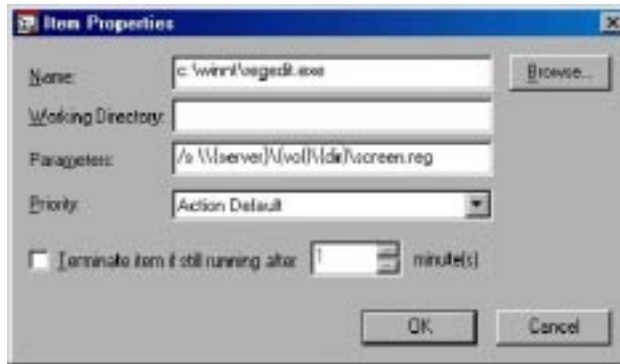
Clicking on the imported .ADM file in the left “Extensible Policies” window will display the policy options in the right window. Click the options that you wish to modify then click the “OK” button.

When you edit an extensible policy in ZENworks 2, the changes are made in NDS rather than in the .ADM file itself. After you add an .ADM file to NDS, you should not delete it. It may be needed if you want to remove the policy from NDS and undo registry changes.

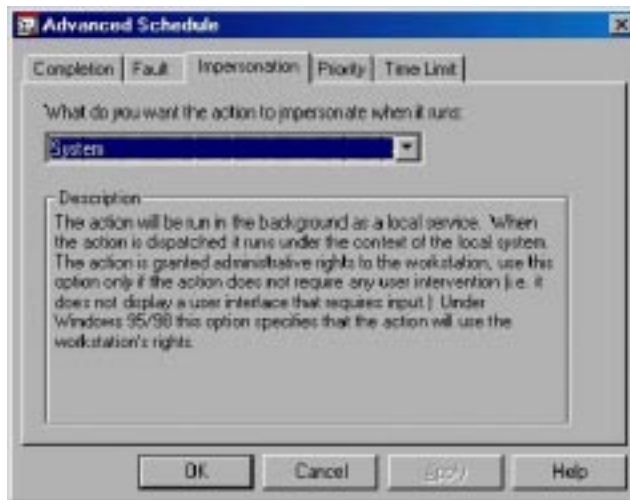
## Creating Registry Settings with User and Workstation Policies

ZENworks User and Workstation Policy packages can be used to push registry settings to Windows 9.x and NT workstations. The basic process is as follows:

1. Create a .REG file. This can be a registry key or keys exported using Regedit.exe, registry keys captured into an .AOT file by SnapShot and then exported from an Application object with NWAdmin to a .REG file, or a .REG file created with a text editor. Unless you are a registry expert, exporting keys from a workstation registry with Regedit or from an Application object with NWAdmin are your best bet. Since .REG files are ASCII text files they can be edited and modified using any text editor.
2. Save the .REG file to a server directory. The affected User or Workstation objects must have Read and File Scan rights to this directory.
3. Using NWAdmin, create an Add Action to a User or Workstation Policy package.
4. Create an Action that runs Regedit.exe with the "/s" option and the name and location of the .REG file.



When making registry changes to an NT workstation that could not normally be made by the logged-in user, make sure you set Impersonation in the Add Action's Schedule, Advanced Settings to "System."



### Example .REG File

The first section of the following .reg file, exported using Regedit.exe then modified with a text editor, changes the Default (not-logged-in) user's screen saver on an NT workstation to "ssmarque.scr." This screen saver, which ships with NT 4.0, displays a scrolling text banner. The second section sets the text and background attributes for ssmarque.scr.

```
REGEDIT4
```

```
[HKEY_USERS\.DEFAULT\Control Panel\Desktop]
"ScreenSaveTimeOut"="60"
"SCRNSAVE.EXE"="ssmarque.scr"
```



```
[HKEY_USERS\.DEFAULT\Control Panel\Screen Saver.Marquee]
"Font"="Times New Roman"
"Size"="36"
"Text"="Welcome to Novell Consulting Services!"
"TextColor"="255 0 0"
"BackgroundColor"="0 128 128"
"Mode"="1"
"Speed"="5"
"CharSet"="0"
```

## Remote Management

The **Remote Management** policy within a User Policy Package object and a Workstation Policy Package object has the following tabs:

- General (Chat and Workstation Diagnostics)
- Control
- View
- File Transfer
- Execute

### Chat

Chat is a utility launched from NWadmin that allows a keyboard conversation to occur between the initiator and receiver of the chat utility.

### Workstation diagnostics

Workstation diagnostics is a utility launched from NWadmin that allows an administrator to view real time workstation information such as client version, NetWare connections, memory, etc.

### Remote view

Remote view is a utility launched from NWadmin that allows a person who initiates the remote view session to view a target workstation desktop, but have no keyboard or mouse support.

***This feature requires distinct rights in NDS***, and has a separate policy setting in the policy package.

### File transfer

File transfer is a utility launched from NWadmin that allows an administrator to choose a target workstation and transfer a file to or from that workstation using IP. ***This feature requires distinct rights in NDS***, and has a separate policy setting in the policy package.

### Remote execute

Remote execute is a utility launched from NWadmin that allows an administrator to choose a target workstation and execute an application on that workstation. ***This feature requires***

*distinct rights* in NDS, and has a separate policy setting in the policy package.

## **Rights wizard**

NWAdmn32, Tools, Workstation Remote Management, Manage Remote Operators

Rights wizard will allow an administrator to easily grant rights to one or many users. These rights include the rights to:

- remote control
- file transfer
- remote execute
- remote view

**Note:** If the master replica of [Root] is not on NetWare 5, then you must select the specific users and specific workstation objects. This is due to the fact that selected trustee properties do not inherit in a NetWare 4 environment.

Rights wizard will also provide a basic view by object of who has what rights on that object.

When to use Remote Management in a UPPO and a WPPO

Novell Consulting recommends.....

## **NDS Rights**

Note: For containers, use the Inheritable Property right rather than searching the subtree for workstation objects. Remember that Inheritable Properties only work with NetWare 5. (See Email from Cydni Tetro)

### **Remote Control**

DM:Remote Control (Write and Inheritable)

WM:Network Address

### **Remote Execute**

DM:ZEN Remote Execute (Write and Inheritable)

WM:Network Address

### **Remote Transfer**

DM:ZEN File Transfer (Write and Inheritable)

WM:Network Address

### **Remote View**

DM:ZEN Remote View (Write and Inheritable)

WM:Network Address

## Printer Policies

This feature is implemented with the Computer Printer policy within a Windows 95-98 Workstation Policy Package object and the User Printer and Computer Printer policy within a Windows NT User and Workstation Policy Package object, respectively. Z.E.N.works printer distribution is not an option for the Windows 3.1 platform.

\*Note When setting up or making changes to printer policies you might need to perform an immediate sync on the partition that you made the changes on, so that changes are replicated to partitions that users are accessing. Printer policies use the slow sync method.

1. Determine what printer drivers need to be distributed to desktops.

**Note:** With Windows 95-98, you only have the option for workstation-based printer distribution. It is implemented this way because printers in Windows 95-98 are only stored in the HKKeyLocalMachine hive.

2. Determine whether to distribute NT printers to users or to workstations.

This is to determine whether it is appropriate for the customer to use user- or workstation-based printer distribution (or both).

With user-based printer distribution, printers “follow” the user around the network, regardless of which workstation they log in from. This approach might not work well for roaming users, i.e., users who travel from one physical site to another physical site. With workstation-based printer distribution, printers will be distributed to workstations regardless of which user is logged in at that workstation.

3. Devise a method (preferably automated) to deliver printer CAB files to the appropriate locations on the appropriate servers.

**Windows 95/98:** printer CAB files must be stored on

\\<file\_server>\sys\public\win95\print\drivers\9

**Windows NT:** printer CAB files must be stored on

\\<file\_server>\sys\public\nt40x86\print\drivers\9

**Note:** These paths cannot be changed.

4. Ensure that file system rights are set. User and workstation objects must have Read and File Scan rights to the locations specified above.

## Task 2: Prepare Prototype Report

The prototype report will detail:

The sequencing of events that need to take place

**Note:** A prototype report template is in Appendix G.

## **Task 3: Deliver Prototype Report to Customer**

For ISO purposes:

- Have the CBM review the report first unless you put a “Draft” watermark on it.
- Send it in PDF + password-protected.

# ZENworks Pilot

*Note: You do not want to implement ZENworks in the pilot until all deficiencies have been resolved and you are at a ZENworks baseline system. Refer to the completed Technical Assessment/Impact Study Report for what needs to be completed to get to a baseline system.*

## Task 1: Perform the Pilot

- Use the information from the Prototype Report.
- Keep track of problems.

## Task 2: Prepare Pilot Report

The pilot report will detail:

- (1) Problems encountered in the pilot.
- (2) How to resolve these problems before implementation.
- (3) What went right in the pilot.
- (4) Updated pilot report becomes the implementation report that the customer can use.

**Note:** A pilot report template is in Appendix G.

## Task 3: Deliver Pilot Report to Customer

# Closing the Engagement

## Task 1: Closing Tasks

## Task 2: Prepare Final Report

The final report will detail:

- (1) What's been done (emphasizing all objectives have been met)
- (2) What remains to be done by the customer; optionally, mention a new work order could be created to finish the implementation

**Note:** A final report template is in Appendix G.

## Task 3: Deliver Final Report to Customer

# Appendices

The appendices are designed to assist you with your project. They are not intended to be all-encompassing (nor could they possibly be). Therefore, please add and/or delete to the information as appropriate for each engagement.

# Appendix A: Lab Requirements

**Note:** failure to have the lab set up properly can result in time/cost overruns and project delays.

Try to set up the lab to emulate the production environment as much as possible; this should make the pilot and implementation phases more successful.

- NDS Design

Set up the tree the way it will be in the production environment. This does not have to include the production environment's partitioning/replication scheme unless you have a way to simulate WAN links in the lab.

- Workstations

We recommend that at least two Pentium-class PCs (similar to the make/model/configuration in the production environment) that meet the following criteria be available for each person packaging or testing applications:

- 200 Mhz or better processor

Faster processors and 100 Mbps LAN connections will further reduce waiting and processing time.

- 128 MB RAM minimum
- 4 GB or greater hard disk

Larger hard disks will allow more or larger disk images to be stored if necessary.

The first partition should be large enough to hold the workstation operating system, Novell network client and several applications. For Windows 95/98 and NT 4.0, a 1 GB partition is usually sufficient. A second DOS-formatted partition should be large enough to hold the disk imaging software and at least 2-3 partition images for each operating system used. For example, if a single machine will be using for packaging or testing applications with both Windows 9x and NT, the second partition should be large enough to hold 4-6 partition images. Since images are usually compressed, a 2 GB partition is usually sufficient.

- Floppy drive
- CD-ROM drive
- Same Novell client software as production workstations (especially if an ACU will be tested in the lab).
- Same patch levels on the desktop operating system as production workstations.
- Network and Server

The customer should provide a lab server running the same version(s) of NetWare (NetWare 4.11 or greater). The operating system versions and patch levels should be consistent with servers in the production environment. This server should be installed in a separate NDS tree, but the lab network should be physically connected to the production network. This will allow access to and from the production network, Internet access, etc.

- The software that your consultant will be snAppShot'ing in the lab / pilot.
- Disk imaging software, e.g., Ghost or Drive Image Pro. This is necessary to reimage the machine after each snAppShot.





# Appendix B: Worksheet for Categorizing Users for Policy Package Objects

**Note:** This is not for software distribution (NAL); rather, it is just for policy package objects.

The goal is to put all users into a maximum of five categories based upon the policies and policy settings they will receive. Ultimately, then, you are defining five desktop “variations” that will be used throughout the company. You want to minimize the number of categories (desktop variations) for ease of administration and troubleshooting, and for standardization within the organization. More categories mean more desktop variations and less desktop standardization (where desktop standardization is one of the goals of ZENworks). For this reason, we recommend having a maximum of five categories.

**Note:** At a minimum, you should always have two categories: one for the administrator(s) and the second for the remaining users. The administrator would have non-restrictive policy settings so that when they log in at a workstation (for troubleshooting purposes) their policy does not restrict them.

**Tip:** Companies have set different backgrounds / wallpapers for the different categories of users so that they could quickly determine which “type” of a user is logged in (for troubleshooting purposes).

1. Determine which desktop operating systems will be using policy package objects:

|               |     |    |
|---------------|-----|----|
| Windows 95-98 | Yes | No |
| Windows NT    | Yes | No |
2. Get the appropriate spreadsheets for these operating systems (see Appendix C).
3. Categorize users by type of standard desktop needed, e.g., by job function:
  - Normal Users = Category A (this category will be the bulk of users)
  - Power Users = Category B
  - Help Desk = Category C
  - Administrative Users = Category D
  - Executive-level Users = Category E
4. Document the defined categories on the appropriate Excel spreadsheets.
5. Document the policies and policy settings on the appropriate Excel spreadsheets.

## Appendix C: Policy Profiling

There are four spreadsheets to be completed to document (“profile”) policies:

- (1) Windows 95-98 User Policy Package Object: 95-98\_UPPO\_Template.xls
- (2) Windows 95-98 Workstation Policy Package Object: 95-98\_WPPO\_Template.xls
- (3) Windows NT User Policy Package Object: NT\_UPPO\_Template.xls
- (4) Windows NT Workstation Policy Package Object: NT\_WPPO\_Template.xls

**Note:** There are no spreadsheets for Windows 3.1.



## Appendix E: Critical Success Factors

Some examples:

- Microsoft Office successfully installed / launched on the desktop (see following Table 1).
- The company logo deployed as the workstation's wallpaper.
- The HP5 printer driver deployed to the desktop.
- Client software updated with ACU.
- Etc.

Essentially, you are listing what the customer wants ZENworks to do and determining what is considered successful.

This listing will define what you need to be testing in the lab and what issues need to be resolved before the pilot.



# Appendix F: ZENworks 2.0 Prerequisites

Be aware that requirements can vary widely depending upon the customer's computing environment. Some aspects of your technical assessment may need to be stress tested in the lab environment.

## Table 1: Workstation Operating Systems Requirements

### Platforms Supported:

- Windows 3.1x only supports these ZENworks 2.0 Policies:
  - \* Help Desk
  - \* Remote Control
  - \* Workstation Import
  - \* Computer System Policies – limited.
- Windows 95 – requires Service Pack 1 or greater
- Windows 98
- Windows NT 3.51
  - \* Not tested with ZENworks 2.0.
  - \* Does not support the Dynamic Local User Policy in ZENworks 2.0; must use NT 4 for this specific Policy.
  - \* Will probably not support new features of 2.0.
- Windows NT 4 -- requires Service Pack 3 or greater.
- DOS – no ZENworks 2.0 support
- Unix – no ZENworks 2.0 support
- OS/2 – no ZENworks 2.0 support
- Macintosh – no ZENworks 2.0 support

### Processor Requirements:

- 486/33 or higher

### Minimum Memory:

- 16 MB for Windows 95 (Future releases of the Novell client will require 20 MB)
- 24 MB for Windows 98
- 24 MB for Windows NT
- 64 MB for Windows 9x or NT to view inventory with NWAdmn32.exe

### Novell Consulting Recommended Minimum Memory:

- 32 MB (for Windows 9x)
- 64 MB (for Windows NT)

## Table 2: Client Software Requirements

The minimum Novell Client required for full ZENworks 2.0 functionality is:

- Windows 3.1x: 2.71
- Windows 9x: 3.1
- Windows NT 4.0:4.6

The Novell Consulting minimum recommended Novell Client is:

- Windows 3.1x: 2.71
- Windows 9x: 3.1 with Service Pack 1
- Windows NT 4.0:4.6 with Service Pack 1

Perform Client upgrades as necessary. See the ACU section in this methodology.

The most recent Novell client software is available from  
<http://www.novell.com/download/>.

**A note on earlier client versions:** Although earlier clients, including older versions of Client 32 and the VLM 1.21 (or later) client software will support some ZENworks functions, they have not been tested with ZENworks 2.0 and are not supported.

A Directory Services connection (no Bindery connection)



## Table 3: NetWare Server Requirements

### Disk Space Remaining on SYS:System

- Novell recommendation: \_\_\_\_\_

### Network Operating System Requirements

- NetWare 4.11 or 4.2 with Support Pack 6 or greater
- NetWare 5 with Support Pack 2 or greater
- 64 MB memory, 7 MB free and 160 MB available disk space on NetWare 4.11 or 4.2 server, without inventory database installed
- 128 MB memory, 7 MB free and 160 MB available disk space on NetWare 5.x server, without inventory database installed
- 128 MB memory, 40 MB free and 220 MB available disk space on NetWare 4.11, 4.2 or 5.x server, with inventory database installed
- IP address bound to inventory database server

### NDS Requirements

- NetWare 4.11 and 4.2:
  - \* NDS version 5.99a or greater required for the latest ZENworks bug fixes
  - \* NDS version 6.03 or greater required for interoperability of NetWare 4 with NetWare 5 in the same NDS tree
- NetWare 5:
  - \* NDS version 7.23 or greater

Note: Perform DS upgrades as necessary using NDSMgr (as one option).

## **Table 4: NDS Design Consideration**

Determine if the tree needs to be re-designed to properly support ZENworks. ZENworks itself does not require an NDS redesign; rather, you need to ensure the existing NDS design is solid. If so, ZENworks will be happy.

Generally speaking, if the NDS tree is designed properly, then designing ZENworks is very straight-forward. Again, the NDS tree should have been analyzed in an earlier step of this consultant guide.

**Note:** Refer to the NDS Design consultant guide for assistance with this step.

## **Table 5: NDS Partition/Replica Placement Considerations**

Determine if the partitioning and replication scheme needs to be re-designed to properly support ZENworks. Issues to consider that would adversely affect ZENworks:

- Master replica placement for Remote Control
- Partitions spanning the WAN
- Too many objects in a partition

## **Table 6: NDS Health Check Considerations**

NDS needs to be stable before installing any NDS-enabled product that extends the schema. A critical factor for ZENworks success is a healthy NDS tree and sensible replica matrix. Slow replication of the tree can result in NDS (ZENworks) changes being truncated or never getting made. At the extreme, corruption of policy packages can occur by making changes over short periods of time.

## Appendix G: Sample Reports

### Notes:

- At some point, the Sample Reports will be a separate document. For now, we have included the appropriate headings and some sample verbiage for all reports.
- This ZENworks consultant guide assumes that the reports are separate deliverables at various stages of the project. This approach makes the report writing easier on you and helps to ensure the customer reads the (smaller but more frequent) reports.
- Optionally, these separate reports makes it possible for you to add a “Sign-Off” signature block at the end of each report (if appropriate), thus using the reports also for status checks.

# Preliminary Report

## Notes:

- The first two paragraphs in the Executive Overview section were copied from the Sample Deliverable report which the customer may have seen; therefore, you may wish to modify, delete, or add to it as appropriate – possibly incorporating the reasons why the company chose to deploy ZENworks and what their business goals are for using ZENworks.
- Replace XYZ Enterprises with the appropriate customer name.
- Suggested layout and headings/verbiage for the preliminary report are as follows.

## Cover Page + Header / Footer

## Table of Contents

### Executive Overview

A key factor in the delivery of value by MIS departments today is focused on Total Cost of Ownership (TCO) of their desktop computing resources. Many independent research organizations have published reports that estimate the costs of owning and maintaining networked personal computers is over \$10,000 per year per computer. The majority of these costs are associated with administration. The Gartner Group estimates that 79% of the TCO of a network is administration. The actual price of the Network Operating System (NOS) only accounts for 3-5% of the total costs associated with deploying and maintaining a network. With so much of the cost involved in owning a network directly attributable to maintenance, organizations must implement solutions that are built to reduce these costs in order to stay competitive.

With more than 33 million users, Novell Directory Services (NDS) is the most widely deployed directory service in the world. ZENworks (Zero Effort Networks) is an NDS-enabled service for workstation administration that significantly reduces the costs associated with networked PCs. ZENworks is the first and only directory-enabled desktop administration suite in the world. The name ZENworks was chosen to suggest that network administrators can remove the obstacles and frustrations that prevent users from effortlessly accessing the resources on the network. Hence, zero effort is required from users.

XYZ Enterprises has chosen to deploy ZENworks for the following reasons:

- **To-Do:** List from the WOA and/or your findings at the preliminary meeting.

XYZ Enterprises contracted with Novell Consulting to assist them with the design and implementation of ZENworks in their current NetWare/NDS environment. This is the first report for XYZ Enterprises which will essentially lay out the roadmap for this engagement. Subsequent reports will lay out specific design and implementation recommendations for XYZ Enterprises.

### ZENworks Engagement Summary and Roadmap

**To-Do:** Fill in the \_\_\_\_\_ with the appropriate project information.

The preliminary meeting for the ZENworks engagement was held on \_\_\_\_\_ <date and time>.

### Team Members / Roles

The following are the consulting team members and their roles in this engagement:

- \_\_\_\_\_
- \_\_\_\_\_

The following are \_\_\_\_\_'s team members and their roles in this engagement:

- \_\_\_\_\_
- \_\_\_\_\_

### **Information Still Needed**

The following documentation and information is still required from \_\_\_\_\_:

**To-Do:** Document any missing documentation not collected during the preliminary meeting and who is responsible for obtaining this information.

If not applicable, remove this section and you can change it to a section stating that the following information was collected and will be used to design and implement ZENworks.

### **Project Goals**

The following are \_\_\_\_\_'s expectations for \_\_\_\_\_ consulting:

**To-Do:** Include the Statement of Agreement and anything "new" uncovered from the preliminary meeting.

### **Lab Requirements**

The following are the necessary lab requirements to ensure a successful engagement. Failure to have an adequate lab can result in project delays or even project failures.

**To-Do:** Include a completed Appendix A here.

### **Critical Success Factors**

The following are \_\_\_\_\_'s critical success factors for this engagement:

**To-Do:** Include a completed Appendix E here.

### **Policy Profiling**

\_\_\_\_\_ 's policies will be implemented as follows:

**To-Do:** Include a completed Appendix B and C here if customer will be implementing policies. If this is not applicable, remove this section.

### **Application Profiling**

\_\_\_\_\_ 's software distribution will be implemented as follows:

**To-Do:** Include a completed Appendix D here if customer will be implementing NAL. If this is not applicable, remove this section.

### **Project Milestones**

The following are \_\_\_\_\_'s milestones for this project:

**To-Do:** For example, Phase 1 = having NAL implemented by <DATE>; Phase 2 = having Remote Control implemented by <DATE>, etc.

#### **Next Steps**

**To-Do:** If you are following the consultant guide, you can state that the next step is to perform a technical assessment and impact study, the goal being to get \_\_\_\_\_ to a baseline system before implementing ZENworks. The completed PFC is needed for this step.



## Technical Assessment / Impact Study Report

Many customer projects have suffered limited success or even failure as a result of their not properly assessing the current environment prior to implementing ZENworks. Problems can be minimized greatly by careful review of the current environment. To minimize this risk, we conducted a technical assessment of your current environment to determine if it is capable of supporting ZENworks.

The *technical assessment* compared your current NetWare environment with the ZENworks minimum recommendations (or Novell Customer Services' real-world recommendations) to identify deficiencies.

The *impact study* here documents the impact of each deficiency found, as it pertains to implementing ZENworks.

**Novell strongly recommends that all of these deficiencies be resolved before any production implementation of ZENworks.**

- Deficiencies found in the technical assessment were:
  - Solutions for resolving these deficiencies are:  
Note: You can state that further testing needs to be done in the lab.
  - Possible problems if these deficiencies are not resolved before the ZENworks implementation include:  
Note: You can state that further testing needs to be done in the lab.
- Persons responsible for resolving these deficiencies are:

## **Design Report**

Copy the appropriate portions from the ZENworks Design section.

# Prototype Report

# Pilot Report

## Closing Report