

# Best Practices for ZCM Implementation Lecture

ZEN19

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# Best Practices for ZENworks® Configuration Management Implementation

ATT Live 2012 – Session ZEN19

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# Presenting Today...

- Bruce McDowell

- Member of founding team for Tally Systems (1990)
  - Introduced first hardware / software inventory technology (patented)
- Joined Novell at acquisition of Tally Systems in 2005
  - Novell Technical Sales Specialist (2005 – 2007)
  - Consultant for redesign of ZENworks Reporting Server Universe (2008)
  - Novell Product Manager (2009)
    - Asset Management, Inventory, Recognition
- Consultant on asset and license management
  - Specialization with ZENworks Asset Management
  - ZENworks Configuration Management implementations and training
  - CNZA 11, CNI, ACNI certifications

# Session Outline

- Five phases of ZENworks implementation
  - Pre-Design Activities
  - Design Prerequisites
  - Design
  - Deployment
  - Maintenance

# ZENworks Software Version

- Session based on “System Planning, Deployment and Best Practices Guide” for Novell ZENworks 11 **SP1**
  - Just to be clear – the session title says “ZENworks Configuration Management” but we’re talking about any of the flavors of the current ZENworks
    - Including the point products, such as ZENworks Asset Management
- Current version of ZENworks = 11 **SP2**
- Updated version of the Best Practices Guide due to be published any day
  - May even be published before this class is presented
- Always look for the latest and greatest version!
  - Credit due to Andy Philp, Mark Schouls and a host of others

# Resources

- Novell ZENworks 11 Documentation page
  - <http://www.novell.com/documentation/zenworks11/>
- Find the latest versions of...
  - System Planning, Deployment and Best Practices Guide
    - [http://www.novell.com/documentation/zenworks11/zen11\\_cm\\_deployment\\_bp/?page=/documentation/zenworks11/zen11\\_cm\\_deployment\\_bp/data/](http://www.novell.com/documentation/zenworks11/zen11_cm_deployment_bp/?page=/documentation/zenworks11/zen11_cm_deployment_bp/data/)
  - ZENworks Installation Guide
    - [http://www.novell.com/documentation/zenworks11/zen11\\_installation/?page=/documentation/zenworks11/zen11\\_installation/data/bookinfo.html](http://www.novell.com/documentation/zenworks11/zen11_installation/?page=/documentation/zenworks11/zen11_installation/data/bookinfo.html)
  - Reporting Server Installation Guide
    - [http://www.novell.com/documentation/zenworks11/zen11\\_installation\\_reportingserver/?page=/documentation/zenworks11/zen11\\_installation\\_reportingserver/data/bookinfo.html](http://www.novell.com/documentation/zenworks11/zen11_installation_reportingserver/?page=/documentation/zenworks11/zen11_installation_reportingserver/data/bookinfo.html)

# Pre-Design Activities



# Understand Management Paradigms

- Management by Exception
  - General rules at a high level, such as user or device groups
  - Exceptions handled for special circumstances
- User-Based Management
  - The classic Novell paradigm, leveraging user identity
- Device-Based Management
  - The default management model until user-based policies are established
- Location-Based Management
  - Enabled by introduction of location awareness
  - Allows different management for the same device at changing locations

# ZENworks: A Flexible Solution

- You may choose to manage based on:
  - **What you are:** The device chosen by the user to access resources
  - **Who you are:** Your identity in the corporate directory
  - **Where you are:** The end user's physical location
- Working in combination, these criteria can automatically invoke different security and configuration postures as the user changes devices, locations, and roles within the enterprise
- Keep these options in mind as you work through the planning processes

# Can You Plan Too Much?

- No, but you can wish you planned more
- The Goal: Total Management, Zero Effort
  - Put a little effort into the plan to save time and effort later
- Plan until you understand everything for the next step
  - Understand your requirements before you design
  - Build your design before you install software

# Pre-Design Activities

- Perform assessments
  - Business assessment
  - Technical assessment
  - Perform both assessments in parallel
    - Expect to spend a week or more on the assessments, depending on enterprise size
    - Sample survey questions for both types of assessment are included in an Appendix of the Best Practices Guide
- Gather other critical information
- Develop a high-level design
- Prepare documentation for the above activities

# Perform a Business Assessment

- What are the business requirements that need to be met by ZENworks?
  - Hold workshops with various departments
  - Survey department heads to see what can help them become more effective
  - Gain complete understanding of how the organization is dispersed and the departments represented at each location
  - Understand scheduling cycles and considerations
    - When can certain tasks be run, and when will they interfere with business
  - Is ITIL (IT Infrastructure Library) in place or contemplated?
    - This will impact the design of your ZENworks solution

# Perform a Technical Assessment

- Technical information to be gathered includes:
  - Which operating systems must be supported?
  - How many users must be supported by the solution?
  - Will there be support for roaming users?
  - How many offices and sites must the solution support, and how many users are at each location?
  - Where are data centers located?
  - What is the network architecture (link speeds, etc.)?

# Perform a Technical Assessment

- More technical assessment questions:
  - Will existing servers be leveraged to support the ZENworks infrastructure? If so you need to understand –
    - Service pack levels and if they meet the requirements for ZENworks
    - Other software, for example, .NET
    - CPU and memory requirements and if they meet the minimum ZCM specs
    - IP addressing for all servers and other devices that will be part of the ZENworks infrastructure
    - Previous versions of ZENworks that might already be hosted
  - What is the DNS infrastructure?
  - What is the DHCP infrastructure?

# Perform a Technical Assessment

- More technical assessment questions:
  - How should the IP subnet design be handled?
  - Which network access methods (VPN, Access Manager, and so forth) must be supported?
  - Which network infrastructure components and design (DMZ, NAT, and so forth) must be supported?
  - What is the directory services design, including which directory services are being utilized (Novell eDirectory or Microsoft Active Directory), and for what purpose (Application support, LDAP, and so forth)?



# Gather Other Critical Information

- Be aware of other services that rely on the network infrastructure
  - Which Service Desk software is currently used by the customer, and how does the deployment of ZENworks Configuration Management fit within this framework?
  - Does the customer have a formal Service Level Agreement (SLA) process in place? If so, what is it and can you access the documentation that explains it?
  - What are the customer's Disaster Recovery and Service Continuity plans? How does this impact the ZENworks Configuration Management design?

# Gather Other Critical Information

- Other services of which to be aware:
  - How does the customer plan for availability of services and resources? Is the customer fully aware of availability requirements?
  - Does the customer leverage a Configuration Management Database (CMDB)? If so, which CMDB? Does the customer have plans to include information that is stored in the ZENworks database in their CMDB?
  - Does the customer have a formal method for keeping track of changes to applications that are published to the end-user communities (change management)?

# Gather Other Critical Information

- Other services of which to be aware:
  - Does the customer have a Definitive Software Library (DSL) and Definitive Hardware Library (DHL)?
  - Is the customer using another framework product in its infrastructure, such as IBM Tivoli, CA Unicenter, or HP OpenView?
  - Does the customer leverage other products, such as SAP?
  - What other major projects are currently taking place at the customers' sites?

# Develop a High-Level Design

- The high-level design consists of two major outputs:
  - Assessment document
    - Number of ZENworks Management Zones needed
    - Placement of Primary Servers
    - Placement of Satellite devices
    - Placement of the Database Server(s)
    - Services that run at each location, based on the business assessment
    - Configuration of network services, such as DNS (forward/reverse lookup), DHCP, and so forth
    - Utilization of network infrastructure, such as L4 switches to front the Primary Servers, Satellite devices, or both
    - Remote access capabilities
  - High-level graphical design diagram
    - The big picture as described in the assessment document

# Prepare Documentation

- Share the assessment document – with the high-level graphic design – with those who contributed to it
  - Seeing the big picture, after contributing a small part, may lead to adjustments
  - Get everyone together for a read-through
  - Then update the documents
- No matter how much planning goes in, there will always be changes
  - ZENworks will accommodate change
  - You should be ready to do so as well

# Did We Mention Documentation?

- Beyond the assessment documents, keep writing everything down!
  - You could get hit by a truck...
  - You might actually get to go on vacation...
  - You could do such a great job that you get promoted!
- One way or another, someone will need to refer to:
  - The Plan
  - The implementation notes
- That someone could be you!

# Design Prerequisites

# Design Criteria/Decisions

- Now that you have assessed what ZENworks will do, fit those requirements to the ZENworks specifications
- A fundamental objective of a design is to balance the need for hardware while easing the load on the customer's network during deployments
  - No one wants to spend too much money on servers, but you can't bring the network to its knees either
- There is plenty to learn and many decisions to be made before any software is installed



# Small Steps First

- What is the initial required functionality
  - If you don't need every feature at the start, don't use them all
    - Start small
    - Scale up
    - Harden
    - Add functionality
    - Repeat
  - Examples:
    - Plan for the required resources of Patch Management, but turn it on later
    - Install ZENworks Reporting Server later when the built-in reports are no longer sufficient

# Certificate Authority (CA)

- Knits everything together
  - Provided to each piece of infrastructure and each agent
  - No valid certificate, no communication takes place
- Internal CA
  - Generated by ZENworks, CA is the first Primary Server
  - Certificate good for ten years
  - Easy to manage: one radio button early during installation
- External CA
  - Some companies like to generate their own
  - Usually only good for 1-2 years
  - Just generally harder to deal with

# Management Structure

- “Traditional” ZENworks was closely tied to eDirectory so management was usually geographic
- With ZENworks 11 and primary servers connected with fast links, you can manage devices your way
- Base a folder structure on –
  - Geography
  - Business function
- Use dynamic groups to automatically take change into account
  - Location awareness can move a device from one logical location in ZENworks to another as the device moves

# Application Store

- “Traditional” ZENworks relied on file repositories on mapped drives or UNC paths to deliver content
  - Inherent problems with synchronization and rights
- ZENworks 11 utilizes a content repository
  - Synchronized between all Primary Servers by default
  - You can custom control synchronization as necessary
    - Schedule to off hours to manage bandwidth considerations
  - Rights are managed directly in ZENworks
    - Bundle and policy assignments
  - Firewall and location friendly
    - Stored files are encrypted and delivered via HTTP protocol

# Content Repository

- Content repository is perhaps the most dynamic piece of ZENworks
  - Storage capacity must start large enough to handle growth
    - Additional applications beyond those identified by planning
    - Updates to all applications
    - New patches arriving every month
    - Application objects migrated from a previous version of ZENworks
- Place the content repository on a separate drive (spindle) to maximize performance
  - Primary Servers and Satellite Servers

# Staging and Grouping

- Use groups to stage deployments
  - Applications, policies, and system updates
- Plan groups and folders to cascade deployments
  - Test devices
  - IT department
  - Early adopters
  - Home workers / VPN users
    - A specialized layer of testing required
  - VIP users
  - General population
- Sandboxing allows for some control over updates to existing objects in the environment

# Infrastructure Placement

- Scalability of ZENworks is a major factor in placing infrastructure in your environment
  - Your survey of where devices are located in the enterprise will help to guide the process
- Must be weighed against the functional requirements
  - Do certain locations require disconnected functionality and therefore an infrastructure node?
  - Do the needs of the network require that content be pre-positioned before it is consumed?
- With that in mind, infrastructure can be planned
  - Primary Servers
  - Satellite Servers

# Infrastructure Placement

- Primary Servers

- Must have LAN speed or close links to –
  - All other Primary Servers
  - The database
  - Any user sources
- Speed is necessary for –
  - Content synchronization
  - Credential verification
  - Access to the database
    - If speed to the database is slow, everything else suffers
- May be physical or virtual servers



# Primary Servers – Disaster Recovery

- From the planning phase forward, include at least two (2) Primary Servers
  - Regardless of how small your implementation will be
  - If you don't, and you lose your one-and-only Primary Server, you're stuck with a “sneaker-net” visit to recover each agent
- Include a primary server at your disaster recovery site
  - Replicate the database to the DR site as well

# Primary Servers – Reporting

- ZENworks Reporting Server must be installed on an existing Primary Server
- ZENworks Reporting Server is “resource intensive”
  - 3 GB minimum RAM
    - Responds well to more
  - 8 GB minimum hard disk
- Plan on installation on a dedicated server
  - Physical or virtualized server
  - In a small ZENworks implementation where you *really* only need one Primary Server, install ZRS on the second Primary that you *should* have for disaster recovery

# Infrastructure Placement

- Satellite Servers

- Primarily designed to reduce load on the network, not to reduce load on the Primary Servers
- Can be used to –
  - Stage content
  - Stage images and imaging processes
  - Distribute authentication
  - Rollup inventory collection
- A satellite server is simply a “promoted” managed device
  - May be a server-class device, physical or virtual
  - May be a workstation-class device for smaller situations

# Infrastructure Scale Assumptions

- Zone limit – 40,000 devices
- ZENworks Primary Server
  - Can provide all services for up to 3,000 managed devices
  - Based on approximately 1,000 simultaneous connections
- Server-grade Satellite Server
  - Dedicated server can provide content services for as many as 1,000 managed devices
- Workstation-grade Satellite Server
  - Dedicated server can provide content services for as many as 250 managed devices
- All of these numbers can change
  - Your results may vary!

# Scalability of the Primary Server

- Main hardware factors that govern scalability are –
  - RAM
    - Majority of operations are performed by zenserver and zenloader
    - ZENworks 11 and above have 64-bit JVM and OS requirements that have relieved RAM requirements
  - Disk I/O
    - Used when serving content for applications and updates
- Minimum hardware recommendations (ZENworks 11)
  - Quad core processor
  - 4GB RAM
  - Disk configuration to separate content from ZENworks and the operating system

# Scalability of the Primary Server

- Other factors affecting scalability –
  - Device refresh frequency
  - Number of Primary Servers being used to deliver content to the managed devices (software, policies, images, patches, inventory collection, and so forth)
  - Number of administrators who have access to ZENworks Control Center
  - Frequency of uploading content in the ZENworks Content Repository
  - Number and frequency of reports run by administrators
- So, basically, everything!

# SuperLab vs. “The Real World”

- Tests are performed in the SuperLab to find the “breaking point” of the system and its components
- Real scalability on the other hand is achieved through...
  - The proper placement of services
  - A well thought-out design
  - The proper configuration of services within the ZENworks system itself
- Exact test descriptions may be found in the Best Practices Guide

# Real World Scalability

- For a representative 3,000 device implementation
  - Three Primary Servers
    - Provide load balancing and fault tolerance
  - A dedicated database server
- Further enhancements to consider –
  - Dedicate certain Primary Servers to specific functions
    - Imaging
    - ZENworks Reporting Server
    - ZENworks Control Center
  - The use of Satellite Servers for distribution, collection, and local site authentication
  - Other considerations are listed in the Best Practices Guide



# Real World Scalability

- Additional recommendations

- It is recommended that Primary Servers and the Database Server be on the same network
- It is NOT recommended (typically) that Primary Servers span any WAN links
- Network utilization issues will appear quickly, and this is mainly due to...
  - SQL traffic between Primary Servers and the Database server
  - Replication of content in the Primary Servers content repository
  - Potential spanning the WAN by Managed Devices

# Scalability of the Satellite Server

- Factors in the scalability of Satellite Servers include, but are not limited to –
  - Physical memory installed on the machine
  - Disk I/O from the requests being handled by the machine
  - What services are being handled by the Satellite Server
    - Collection, content, imaging, authentication
  - The number of managed devices that are hitting the server, and how frequently
  - Frequency of distributions
  - Class of hardware
  - Class of operating system

# SuperLab vs. “The Real World”

- Once again, tests performed in the SuperLab locate the “breaking point” of the service
  - We assume the following...
    - The Satellite Server running on server-class hardware can handle up to 1,000 Managed Devices
    - The Satellite Server running on workstation-class hardware can handle up to 250 Managed Devices
  - For larger sites (250 devices and beyond)...
    - Use multiple Satellites for redundancy and load balancing
  - For smaller sites (up to 250 devices)...
    - Use your judgment

# Infrastructure Scale – Revisited

- Remember the published scaling limits
  - Zone limit – 40,000 devices
  - ZENworks Primary Server – 3,000 managed devices
  - Server-grade Satellite Server – 1,000 managed devices
  - Workstation-grade Satellite Server – 250 managed devices
- If working with a single point product, you MIGHT experience different scaling
  - Large financial institution, locations nationwide
    - 64,000+ managed agents – ZENworks Asset Management only
    - 14 Primary Servers – planning for ~5,000 managed devices per server
    - NO Satellite Servers
    - Dedicated MS SQL database server (a hulking beast)

# Infrastructure Scale – Options

- What to do if you have more than 40,000 devices
  - And you're not running ZENworks Asset Management alone
  - And you're not interested in pushing the envelope
- Deploy multiple zones
  - Divide the enterprise into logical pieces
  - Stand-up similar ZENworks infrastructures
  - Some objects (such as application bundles) may be created in one zone and transferred to other zone(s) for consistency
- Constraints
  - More work to manage multiple zones (close to 2x?)
  - Available reporting does not work with multiple zones
    - Custom reporting tools could deal with this

# The ZENworks Database Server

- The main things you need to consider when it comes to the database server are –
  - How many devices are you managing?
    - If the number is greater than 1,500 then you may want to consider using Oracle or Microsoft SQL Server
  - Will you be able to utilize clustering technologies to achieve a higher level of fault tolerance
    - You need more details on the organizational continuity and availability management plans
  - Virtualization
    - Not recommended
    - Above the limits of a stand-alone Sybase installation, the interaction of database and content flow would severely degrade performance

# Database Scalability

- Database platforms and numbers of devices
  - Sybase 12 (embedded) testing and development
  - Sybase 12 (remote) production up to 1,500
  - Microsoft SQL Server 2008 R2 production up to 40,000
  - Oracle 11g R2 production up to 40,000
- Follow vendor-specific best practices when it comes to database backup, tuning, and maintenance
  - It is critical that you completely understand the vendors' recommendations and best practices
  - Your database administrator(s) need to be very close to this project

# Database Server – Sybase

- One of the most important aspects of Sybase database maintenance is regular backups of the database files
- Sybase provides its own backup tool to do this, and it is freely available for you to download from the iAnywhere website
  - The name of the backup tool is **dbbackup**
  - Details on the tool can be found here:
    - [http://www.iAnywhere.com/developer/product\\_manuals/sqlanywhere/1000/en/html/dbdaen10/da-dbbbackup.htm](http://www.iAnywhere.com/developer/product_manuals/sqlanywhere/1000/en/html/dbdaen10/da-dbbbackup.htm)



# Database Server – Sybase

- Novell does not provide any support for this tool – all issues related to the use of this tool must be logged with Sybase
- The Sybase database can be backed up either when it is running or shut down
  - When it is running use dbbackup
  - When it is shut down you can perform a simple file copy
- See the Best Practices Guide for more information
  - Backups
  - Tuning and maintenance
  - Performance monitoring
  - Fragmentation

# Database Server – Microsoft SQL

- Most important aspects of managing and maintaining your Microsoft SQL Server database –
  - You should have in-house skills or have ready access to a contractor, consultant, or partner to manage and maintain the Microsoft SQL Server based on the best practices that Microsoft outlines for regular database management
  - There must be regular database backup routines in place
    - This should also be documented or noted in the design document
  - Considerations for clustering (high availability) of the database server should be made and documented
  - Be familiar with the tools that Microsoft provides to plan, analyze, and maintain the Microsoft SQL Server infrastructure

# Database Server – Oracle

- You must rely on the skills of the in-house database administrator(s) to ensure you are installing, updating, and maintaining the database properly
- The individual(s) responsible for the day-to-day management of the Oracle infrastructure must be involved in the ZCM deployment project from Day One
- There must be regular database backup routines
  - This should be documented or noted in the design document

# Database Sizing and Performance

- Database servers are very sensitive to disk performance
  - More smaller disks are always faster than fewer larger disks
  - Separate disks for temp, db and logs
- It is very important to note that ZCM performs better with a dedicated database server that is not shared with other database applications
- As a general rule of thumb, Novell has seen the database size increase at a rate of approximately 1GB per 1,000 devices in the zone

# Virtualization

- Remember to plan your installation carefully, and allocate the right amount of resources if you are going to install in a virtualized environment
- Currently Novell supports the following platforms –
  - XEN
  - VMware ESX
  - VMware Workstation
  - Microsoft Virtual Server

# Network Considerations

- ZENworks requires that a number of ports be opened
  - The list of ports to be opened varies depending on the ZENworks features you will use
  - See the Best Practices Guide for details
- Involve your network departments in planning –
  - Network services – The teams who manage the physical network infrastructure and hardware
  - Security services – The teams who manage the security aspects of the network infrastructure and services
  - Operations – The teams who manage the provisioning of services and resources to the devices that ZENworks Configuration Management will manage

# DNS and DHCP Services

- DNS forward and reverse lookup should be properly configured so that you can resolve servers using both their DNS name and IP address
- It helps when workstations are registered in DNS as well – DDNS required
- DHCP needs to be properly configured for imaging purposes
- PXE may need to be enabled on workstations

# Time Synchronization

- Everything has a time stamp
  - Ensure everything is time synchronized, it's important
- All servers in zone must have time synchronization configured
  - It is not needed for devices but it is recommended to ensure a well tuned infrastructure
- For eDirectory customers it may be an option to point the ZCM servers to eDirectory Time Sources via NTP
  - Usually all clients use the same time sources via the Novell Client, so the system will be in complete harmony



Design

# Design Activities

- Design activities bring together –
  - Data from your business and technical assessments
  - The capabilities of ZENworks
- This is the most intensive part of planning the ZENworks deployment, accounting for up to 80% of overall project time
  - If ZENworks is the one tool that will be used for configuration management, do not underestimate the value of designing carefully and thoroughly
- A series of design workshops with teams from across the organization is one way to proceed

# Design Activities

- Topics for design activities should include, but are not limited to –
  - Infrastructure topics
    - Management Zone configuration
    - Locations and Network Environments
    - User sources
    - Role-based administrative accounts
    - Folder structure
    - Infrastructure placement
  - The overall infrastructure layout should be developed with the most senior members of the customer's IT departments

# Design Activities

- More design activity topics –
  - Device discovery and agent deployment
  - Migration tactics, if applicable
  - Software packaging
  - Software delivery
  - Device and user policies
  - Inventory gathering and reporting
  - OS deployment, including consolidation of existing OS images (for example, universal imaging)
  - Remote management capabilities
  - Database design (maintenance, performance, backups, etc.)

# Zone Management Settings

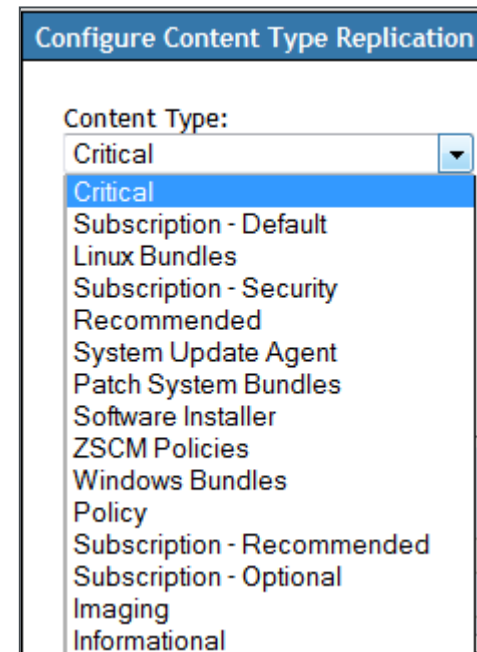
- There are a myriad of settings at the Zone level – here are some of the most important
  - Content Replication
  - Content Blackout Schedule
  - Device Refresh Schedule
  - Device Removal Schedule
  - Dynamic Groups Refresh Schedule
  - ZENworks Agent
  - Inventory Schedules
- Other suggested settings in the Best Practices Guide

# Primary Server Content Replication

- Settings dictate how frequently Primary Servers replicate content in the Content Repository
  - Also available settings for throttling and checksums
- Default setting of every 5 minutes likely too often
  - Set to a value realistic for your environment
- All primary servers included in replication by default
  - This may be configured
- Replication may be configured at bundle folder level
  - Good for managing complex configurations
  - For example: managing Patch Management content

# Satellite Server Content Replication

- Same controls available as for Primary Servers
- You may also configure very precise control over the type of content moved and when



# Content Blackout Schedule

- Prevents content distribution to managed devices
- Not usually configured at the zone level unless there is an event affecting the entire enterprise
  - A corporate change freeze is a possible example
- More likely to be set at the device or folder level
  - By department or location for example



# Device Refresh Schedule

- Two agent refresh cycles
  - Only the full refresh performs content heavy lifting
- Start with default settings and adjust for circumstances
  - More frequent refreshes place added burden on ZENworks and traffic on network
  - Randomizing refresh helps prevent overload
    - Never want too many devices attempting to refresh simultaneously
    - Effectively increases scalability of infrastructure

# Device Removal Schedule

- Default setting is to flag as lost after 30 days
  - Not to automatically remove device from database
- Lots of reasons to not remove automatically
  - Could just be an extended vacation or medical leave
  - Loss of historical data
  - Still responsible for software licenses until removed
- Easy to report on aged devices
  - Filter for “Lost” Device State
- Flag device as “Retired” if temporarily out-of-service

# Dynamic Groups Refresh Schedule

- Use of dynamic groups recommended whenever possible
- Membership in dynamic groups should be refreshed regularly to assure expected and accurate results
  - Manual refresh is also available from device Action menu
- Daily scheduled refresh is recommended

# Location Awareness

- Defines locations in the enterprise based on common network parameters
  - IP address, gateway, access point, DNS settings
  - Differentiates between wired, wireless or dial-up connections
- Define which servers handle which roles for managed agents that map to a defined location
  - Collection – inventory rollup
  - Content – distribution of bundles
  - Configuration – ZENworks settings
  - Authentication – against eDirectory and/or Active Directory
- Replaces closest server rules (except for defaults)

# ZENworks Adaptive Agent

- When agents request a service, Primary or Satellite Servers could be busy or unavailable
  - Location rules (and default closest server rule) determine where the agent will go to find services
  - Before that, retry times / counters determine how “patient” the agent will be before moving on
  - Adjust busy server times to keep agents from attempting to jump around the network more than necessary
- Consider disabling unused agent features
  - All agent features are installed by default, so any disabled features can be easily re-enabled at a later date
- Choose whether to let users uninstall applications

# Adaptive Agent Deployment

- When a primary server is installed, it creates a set of default deployment packages
  - Covers broad spectrum of operating systems and platforms
  - Tuned to register with the originating primary server
  - Accessed at [http://\[server\]/zenworks-setup/](http://[server]/zenworks-setup/)
  - Packages are executables, may be used outside of ZENworks
    - Variety of command-line switches supported to control operation
- Custom deployment packages can be created to use your registration keys and other customer parameters
  - Configure your deployment packages before moving into testing your deployment process

# Adaptive Agent Deployment

- Variety of methods available for agent deployment
  - Use ZENworks Control Center to deploy the agent from the ZENworks Server to the device
    - Simple File Sharing must be disabled, administrative credentials available
  - At a device, use a Web browser to download and install the agent from the ZENworks Server
  - Include the agent in an image, apply the image to the device
  - Use a login script, Windows group policy, or ZENworks 7 application object to install the agent
  - Use a third party tool to push and execute the agent installation package
    - I know a customer who has very successfully deployed over 64,000 agents using Microsoft SCCM

# Inventory-Only Agents

- There are some circumstances where you don't need full management of a device, but do need inventory
- For these cases we have inventory-only agents
  - Scheduled and reconciled independently
  - Available for a variety of platforms
    - Windows
    - Linux
    - Several UNIX variants
      - AIX, HPUS, Solaris
  - Accessed at [http://\[server\]/zenworks-setup/?pageId=inventory](http://[server]/zenworks-setup/?pageId=inventory)



# Device Folder and Group Structures

- Folders and groups may be created at any time but work best if in place before registering devices
- Consider how you plan to manage devices –
  - How will you apply policies and application bundles?
    - Functional or geographic
  - Do you have administrators who need to have access to specified sets of devices or bundles?
  - Will you need site-specific inventory schedules or other settings?
- Design to a level of efficiency – but stay away from creating too much granularity

# Registration Rules and Keys

- When the ZENworks Adaptive Agent is deployed, it registers with the Management Zone and becomes a managed device
  - As soon as the device is managed, appropriate configuration settings and assignments are made
- You can control the naming of the device in the zone and the folder / groups to which the device is added
  - By default, the device's host name is used
  - Device is placed in /Servers or /Workstations folder
- Registrations rules and keys, singly or in combination, are used to customize the registration process

# Registration Rules and Keys

- Registration rules automatically add devices to folders and groups of your choosing
  - Filtering is based on device criteria such as system type, CPU, IP address, etc.
  - Default registration rules are what send devices not covered by a custom rule to the /Servers and /Workstations folders
- Registration keys carry the same parameters as rules but are specified directly as part of agent deployment
- Rules vs. Keys
  - If you can direct deployment in a way that keys would be effective, use them
  - If deployment is less demographic-specific, use rules

# Registration

- Device Naming configuration allows you to define how devices appear in the ZENworks Control Center
  - Host name, host name + IP address, and so forth
- Enable dynamic device renaming so that device names will be updated as they evolve
  - Disabled by default
- Device reconciliation deals with devices that have been reimaged and reintroduced to the zone
  - New registration creates a new unique GUID
  - Reconciliation by serial number and MAC address directs the new registration to the existing device record
  - Prevents duplicate device records (90+% of the time)

# User Sources

- Linking to authoritative sources can provide the same type of management structure for users as folders and groups do for devices
- Provides dynamic information and provisioning as the user community changes
  - Link is dynamic, no wait for the next scheduled sync
  - Link is read-only, always, through LDAP
  - Multiple sources may be configured simultaneously
  - Authenticates ZENworks administrator logins
- Specify containers holding users to make data retrieval more efficient

# Inventory Schedules

- Inventory is the foundation of many ZENworks tasks
- How will you use your inventory data?
  - This will determine how often to schedule scans
  - Weekly is generally sufficient for asset management
  - Avoid daily schedules that cause unnecessary system loading
- Consider a weekly schedule that starts on Saturday
  - Any devices left turned on over the weekend are processed
  - Remaining devices “self randomize” based on when workers arrive at the office to start the week
- Not all devices will always be available on schedule
  - “Process immediately if device unable to execute on schedule” catches devices the next time they connect to ZENworks

# More Light Reading

- Other topics to review in the Best Practices Guide
  - Linux Subscription Options
  - Role-Based Administration Accounts
  - Remote Management
  - Application Management Policy Management
  - Linux Patch Management
  - Imaging
  - Configuring a Layer 4 Switch

# Lab Testing and Validation

- Lab testing is key to the success of the design
  - Prove design decisions before pushing out into the enterprise
  - Verify that functional criteria are met
  - Demonstrate that deployment will be successful
- Create acceptance tests to track completion / success
  - Individual acceptance tests may be constructed as a flow chart to guide the testing process



# Lab Testing and Validation

- Lab setup should closely reflect your production environment, including –
  - Directory structure (eDirectory and/or Active Directory)
  - Major network infrastructure components
    - Data centers, representative Primary and Satellite server sites
  - Exact replica of ZENworks infrastructure design
    - Updated as changes are made
  - Bundles, policies, images to be deployed in production
  - Sample endpoint devices
- Use the lab to test new ZENworks updates
  - Roll out service packs and patches in the lab first

# Design Documentation

- The most important aspect of the design process
  - Document everything
    - Design decisions
    - Infrastructure
    - ZENworks services
  - Keep the documentation up-to-date going forward
    - Powerful knowledge transfer document for new staff
    - Historical perspective of how and why decisions were made can be very helpful in the future

Deployment

# May We Install Some Software Please?

- We've planned and documented
  - We understand how the software will be used
  - We understand the enterprise environment
- Now we can start introducing ZENworks
- Practically, many times we arrive at this point rather more quickly than described
  - Customers often don't have time for extensive planning or just won't take the time before getting started with installation
  - There's still opportunity to move ahead professionally
    - Listen to the environment while you deploy
    - Let the adaptability of ZENworks work for you

# New ZENworks Customer

- Deployment into a new customer environment is easier as there is no interference from existing ZENworks technology
- Best if you can test in a “model office” configuration
  - Try everything out a few times
  - Then move on to the production environment
- Plan your deployment “marketing campaign”
  - Users need to know about changes affecting them
  - Schedule deployment phases so users are prepared
- Internal support teams need to be trained to support the new software and processes
  - Involve them directly in the deployment

# Deploying the Product

- Install the first primary server and the database
  - Remember to involve your database administrator directly
    - This is the most complicated part of the initial installation
    - You'll need the DBAs if you're working with MS SQL or Oracle
- As soon as you installation the first Primary Server, make two quick backups for disaster recovery
  - First server configuration files
  - Certificate authority
    - See section 35.1 (as of ZENworks version 11 SP2) for instructions on taking these backups
  - Store the backups in a safe place!

# Deploying the Product

- With the management zone established –
  - Create workstation folders
  - Create registration rules / keys to control placement of devices
  - Create roles, then assign administration rights
  - Configure network environments and locations
  - Configure System Update
  - Configure user sources
  - Configure inventory scheduling
  - Configure remote management
  - Create a policy to configure the system or application settings for Windows or Linux managed devices
  - Create the required application bundles

# Device Discovery

- Discovery tasks provide an agentless method for identifying devices in your environment that can be managed
  - Can also pull devices directly from Active Directory or eDirectory as an LDAP task
- It also identifies network infrastructure devices
  - Hubs, routers, switches, printers
    - Generally can identify manufacturer, product, serial number
    - For network printers, pulls pages printed, % consumables remaining
- Tasks generally organized by IP subnet
  - Can be managed by location – if your IP addressing is setup by location



# Device Discovery

- Discovery tasks should be run during business hours
  - Devices won't respond to pings and discovery probes if they aren't turned on
  - Virtually no impact on network or device resources
  - Vary schedule to different days of the week to achieve complete coverage
- Returns list of “manageable” devices
  - List includes devices running an operating system that will support the ZENworks Adaptive Agent
  - Also includes devices that “might support” the ZAA
  - May create a deployment task directly from the list
    - May also delete or ignore devices that require no further attention

# Deploying the Product

- Deploy an initial set of managed devices
  - Target devices in your previously defined test groups
- Evaluate your results:
  - Devices are in the correct location (Workstation folders)
  - Devices have successfully scanned and uploaded inventory
  - Devices can be remotely controlled
  - ZENworks Primary Server(s) and the database are stable
  - Devices can be refreshed and do not report errors
- Poll the test and management teams for consensus before moving ahead with the deployment

# Deploying the Product

- Working with your design document –
  - Add more Primary and Satellite Servers
    - Consider fully deploying the infrastructure before adding more agents
      - This allows for location definitions and server roles to be completely setup
    - If all infrastructure is not installed in advance of agent deployment, avoid deploying agents until the relevant servers are in place
  - Extend the managed device footprint
- Monitor the back-end servers and database for –
  - Disk utilization
  - Memory
  - Peek processor utilization
- Be prepared to make adjustments to the plan

# ZENworks Control Center Timeout

- By default, ZCC times out after 30 minutes
  - The timeout may be changed to be more relevant
- Edit files config.xml and custom-config.xml
  - Windows path:
    - %install%\Novell\ZENworks\share\tomcat\webapps\zenworks\WEB-INF\
  - Linux path:
    - \Opt\Novell\ZENworks\share\tomcat\webapps\zenworks\WEB-INF\
  - Code to change is the first setting block

```
<!--  
    Number of minutes before ZCC will timeout.  
-->  
<setting id="timeout">  
    <value>30</value>  
</setting>
```

# Migration from Previous ZENworks

- For customers with previous versions of ZENworks in place who wish to leverage that work, a migration utility is available
- Utility can migrate –
  - Application objects and source content
  - Image objects and image files
  - Policy objects and applicable policy files
  - Imported workstation objects
  - Associations for application objects and policy packages
    - With eDirectory already in the picture, why not take advantage of previous work to jumpstart the new ZENworks implementation?

# Migration from Previous ZENworks

- After migrating objects from the previous version of ZENworks, test them carefully in the test environment
- Migrated applications are automatically added to the Content Repository
- ZENworks versions 4-7 and ZENworks versions 10-11 cannot co-exist
  - The new ZENworks agent installer will uninstall the old agent
  - Plan accordingly as part of your deployment plan

# Other Migration Options

- If you have data in a ZENworks Asset Management version 7.5 database, you may migrate that data
  - Workstation objects with inventory data
  - Software local products
  - User Defined Fields (now Administrator Defined Fields)
  - Asset Management data
    - Purchase records
    - Catalog products
    - License records
- Migrate data from ZENworks Linux Management infrastructure
  - Bundles, policies, devices and associations

# Migration References

- Find the latest version of the migration utilities
  - [http://\[server\]/zenworks-setup/ /?pageId=tools](http://[server]/zenworks-setup/ /?pageId=tools)
- For more information –
  - ZENworks Configuration Management Migration Guide
    - [http://www.novell.com/documentation/zenworks11/zen11\\_cm\\_migration/?page=/documentation/zenworks11/zen11\\_cm\\_migration/data/bookinfo.html](http://www.novell.com/documentation/zenworks11/zen11_cm_migration/?page=/documentation/zenworks11/zen11_cm_migration/data/bookinfo.html)
  - ZENworks Asset Management Migration Guide
    - [http://www.novell.com/documentation/zenworks11/zen11\\_am\\_migration/?page=/documentation/zenworks11/zen11\\_am\\_migration/data/bookinfo.html](http://www.novell.com/documentation/zenworks11/zen11_am_migration/?page=/documentation/zenworks11/zen11_am_migration/data/bookinfo.html)
  - ZENworks Linux Management Migration Guide
    - [http://www.novell.com/documentation/zenworks11/zen11\\_cm\\_zlmmigrate/?page=/documentation/zenworks11/zen11\\_cm\\_zlmmigrate/data/bookinfo.html](http://www.novell.com/documentation/zenworks11/zen11_cm_zlmmigrate/?page=/documentation/zenworks11/zen11_cm_zlmmigrate/data/bookinfo.html)



Maintenance

# System Updates

- With paid ZENworks maintenance comes a System Update Entitlement, a separate authentication code
  - Add this to the System Update Settings page
  - This enables automatic checking and downloads for System Updates
    - Schedule these to run on a scheduled basis such as once a week
- When System Updates become available, schedule installation in your test environment
  - Once validated, then schedule for application in production
  - Remember that system updates involving Windows managed agents will likely require device reboots
    - Linux agent updates do not require reboots

# Product Recognition Updates

- Product Recognition Updates (PRUs) update inventory recognition for hardware and software
  - PRUs are delivered monthly around the first of each month as a System Update
  - This System Update is unique in that it does not require a device reboot
    - Nor do PRUs need to be scheduled for deployment
    - Simply merge them into the database and the new Knowledgebase files are then distributed automatically and unobtrusively to installed agents
- There isn't really a good reason to NOT apply PRUs
  - Certainly you should validate them through your test system
  - But better inventory is always better

# Adding Software Recognition

- Not every software title will be found in the ZENworks Knowledgebase
  - Lesser known manufacturers and titles
  - Niche industry applications
  - Brand new updates to mainstream products
  - Internally developed applications
- Software Local Products feature lets you fill the gaps
- Leverages software files data gathered by inventory
  - Assumes and requires that you have collected software files data in addition to regular inventory data
  - Enabled through inventory configuration

# Patches

- Novell releases ZENworks patches on an as-needed basis on an irregular schedule
  - Patches may be for minor issues or relatively critical problems
  - Imaging driver updates are delivered as patches most months
- Subscribe to receive notification of patches
  - Subscriptions available for various products
  - <http://support.novell.com/patches.html>
- Patches may involve simple or fairly complicated installation procedures
  - Test in your test environment first
  - Develop any bundles necessary for deployment and then export them for use in your production environment

# Backups

- Back up everything religiously
  - Include the database in your regular database backup and maintenance schedules
    - If you are using one of the Sybase variants, add the dbbackup tool to your maintenance procedures
  - If your primary servers are virtualized, take a snapshot of them regularly

# Deployment Management

- The environment changes over time – take some steps to keep up with change
  - Run discovery tasks periodically to find devices not under management
    - Always try to maximize penetration of agents in your environment
  - Track inventory scans to make sure agents are responsive
    - Watch for devices that have not scanned for some reasonable period
    - Try to understand why devices are not sending data
  - Evaluate software files data periodically to keep up with your software catalog
    - If you have complete control over software distribution, fingerprint apps not recognized through inventory as part of the bundle testing process



Questions?

Thank you.

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