ZENworks® Orchestrator
Overview
Real Time Infrastructure for the Data Center

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Agenda

- Market Overview
  - Setting the Context
    - Dart Board\BluePrint\Architecture
    - Challenges

- Virtualization 3.0
  - Data Center Consolidation
    - Real Time Infrastructure
    - Policy based Control
    - grid Facilities

- Data Center Automation Solution
  - Orchestration
  - OSGI
  - Eclipse
Systems Management Universe
Systems Management Blueprint

What is the vision? → Where are we now? → Where do we want to be? → How do we get to where we want to be? → How do we keep the momentum going? → How do we check if our milestones have been reached?

Visualize
- Design, Deploy, Dashboard

Orchestrate
- Workload definition, Schedule, Load Balance, Accounting, Pre-emption, Reservation, Grid, Policy

Manage
- Service Delivery & Support
  - Incident, Problem, Availability, Service Level, Configuration, Change, Release, Capacity, Financial
- Applications Mgmt
  - Requirements, Design, Build, Deploy, Operate, Optimize

Instantiate
- Create VM, Allocate Storage, Associate Users, Bind to Network

Contain
- Creation
  - (OS, App, Network, Storage, Personality)
- Repository
  - (Lifecycle Data)

Relate
- Federated Configuration Management Database
  - Relationships, Incidents, Problems, Known Errors and Changes associated with each CI

Discover
- Lifecycle Management, Asset Discovery, Dependency Mapping, Service Catalog, Event Capture, Storage Discovery, App Fingerprint

Planning to Implement Service Management

Business Processes

The Technology

Monitor
- Security & Identity

Audit & Compliance

Server
- Desktop
- Mobile Devices
- Network
- Storage
- Software

http://www.novell.com/products/zenworks/orchestrator/
Architectural High-level Design
Data Center Challenges

- Improve service levels for business users
- Address power and space constraints
- Manage costs
- Ensure high performance, security and availability
- Satisfy internal and external auditors
- Maximize current and future IT investments
Virtualization 3.0 Infrastructure
Data Center Management Solutions

ZENworks® Virtual Machine Management Pack

ZENworks® HPC Management Pack

Future “Management Packs”

ZENworks Orchestrator
Novell® ZENworks® Orchestrator

Overview

ZENworks Orchestrator uses intelligent automation to manage heterogeneous virtual machines to align IT to business requirements, control costs, and minimize your risks.

…thus giving you more control and flexibility to align business objectives to IT value.
Orchestrator Landscape

Applications

Web/Services

Orchestrator Server (Java Based)

Data Grid

Node Agents

Linux

Windows

Solaris

AIX

HP/UX

OS X

CLI

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CLI
ZENworks® Orchestrator
Features

• Physical and virtual machine provisioning
• Workload orchestration
  – Discovers resources, evaluate workloads, schedules tasks
  – Parallel execution across distributed devices
• Application deployment
• Managed from central CIM-based model

Virtual OS
Application stacks with fault containment and intrusion protection

Physical OS
Comprised of a hypervisor, device drivers and agents needed by specific hardware
ZENworks® Orchestration Server

- Resource Discovery
- Workload Management
- Dynamic Scheduling
- Policy Management
- Auditing/Accounting
- Software Compliance
- VM Lifecycle Mgmt
Resource Discovery

- Automated discovery of resource attributes as ‘facts’ including hardware and software details
- Automatic detection of new resources
- On-line & off-line resources
- Integrated resource provisioning
Policy-based Resource Deployment

- Policy-based control system
  - Constraint based job assignment & rules execution
  - Reservation of resources
  - Pre-emption of lower priority tasks for critical tasks
  - Scheduled and event driven tasks
  - Deploys and moves workloads dynamically

- Heuristic learning
  - Pre-position workloads based on history
  - Task to resource optimization

- Extensible Job Definition
  - Python-based job definition language
  - XML based Policy definition language
Dynamic Scheduling

- user.constraint
- job.constraint
- resource.constraint
- resource.facts
- multi-dimensional resource broker

Optimizations:
- placement
- allocation
- execution

SLA Monitoring Systems
Auditing / Costing / Reporting

- All activity is logged to RDBMS database and available for reporting
- Aggregated Cost Accounting for managed resources
- Auditing and event logging for all provisioned jobs
- License limit policy for compliance
- Reporting of virtual resources based on time used or compute processing consumed in a shared resource pool
ZENworks Orchestrator
Consoles

• Administrative and Operational Control
  – Administers ad-hoc (manual), programmatic, and dynamic provisioning of virtual resources to fixed or shared resources within a data center

• Architectural and Engineering Development
  – Provides an integrated development environment (IDE) GUI for creating policy extensions
  – Enables 3rd party application integration for utility based SOA applications
  – Full command line interface support
Data Center Automation Solutions
Gives you the ability to confidently employ virtualization in your data centers. From VMware to Microsoft to Xen, this policy-based solution automates the process of deploying and managing virtual data center assets, as well as dynamically provisioning workloads and ensuring business continuity.
Virtual Machine Lifecycle

Discover
On-box incubator

Check in
Version control

Create
On-box tool (find)
Incubation job (make)

Edit
Config: Change (using Sandbox)
Runtime: Facts (temporary)

Manage
Lifecycle, Cloning
Location, Runtime

Monitor
Status (location state)
Performance (realtime, trends)
Availability

Deploy
Test (provision)
Production (Sandbox)

Operator
Actions

Runtime (Dynamic)

Developer
Actions

Config (static)
VM Lifecycle Management

- Provides powerful multi-vendor dynamic virtual machine automation services
Virtual Machine Management Pack

• Resource Management
  - Discovery of existing virtual machine hosts, stores version and configuration details
  - Virtual machine images are discovered and brought under resource control
  - Discovery of virtual machine images including XEN and VMDK formats
  - Discovers off-line and on-line VM's and templates

• Inventory
  - Maintains a library of virtual machine images and hosts
  - Like physical resources, VM's have ‘facts’ describing attributes, and can be grouped
Virtual Machine Management Pack

• Heterogeneous virtual machine management
  - Supports VMware, Xen, and Microsoft VM's
  - Deployment, re-deployment/rollback
  - Associates physical, virtual, and storage compute nodes

• Extensible framework
  - VMM providers abstracts native interfaces for performing actions on the hypervisor
  - Designed to quickly create VM providers by end user customers for other hypervisor's
Virtual Machine Warehouse

- Provides a common interface for the creation of virtual machine images or templates
- Wizard based management console steps users through the creation process
- Command line interface to support integration with scripted environments
- Integrates with ZENworks® Orchestrator to dynamically provision “Golden” standard images to resources to ensure compliance in the environment
Virtual Machine Warehouse
Functions

• Create / Clone
  - Creates virtual machine images to be stored or deployed
  - Create template for building images to be stored or deployed
• Import : Add a new VM in the Image Repository
• Export : Export the Gold Master version of the VM for deployment
• Version Control
  - Check-in : Check in a newly modified VM, version assigned upon check-in
  - Check-out : Check-out any version for modification.
  - Virtual machine images can be used to restore the environment if needed
• Commit
  - Creates a new version of the VM
  - Used to update any changes made by ZENworks Orchestrator
• Retire / Delete / Destroy / Decommission deployed images
ZENworks HPC Management provides grid-based management of applications and enables workloads to be distributed for parallel execution. This includes automated high-performance multicast data distribution which can move and copy large volumes of data to remote resources for processing.

Thus enabling high performance computing (HPC) workloads to be distributed across your computing resources to gain maximum efficiency.
ZENworks® HPC Management

Grid Scheduling

- Grid-based management of grid-based applications
- **Compute Grid** - Basic Distributed Processing for parallel execution.
- **Data Grid** - Multicast Data Distribution enables large volumes of data to be moved/copied to remote resources for processing.

**Applications**
- Financial Services
- Manufacturing
- Energy
- Pharma
- Reporting
- Archival
- Risk Analysis
- Customer Services Plus SOA Apps

**Grid job type**

grid task/job distribution/mgmt
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