LinMin™

LinMin Bare Metal

System Deployment & Recovery of Linux and Windows Physical and Virtual Systems

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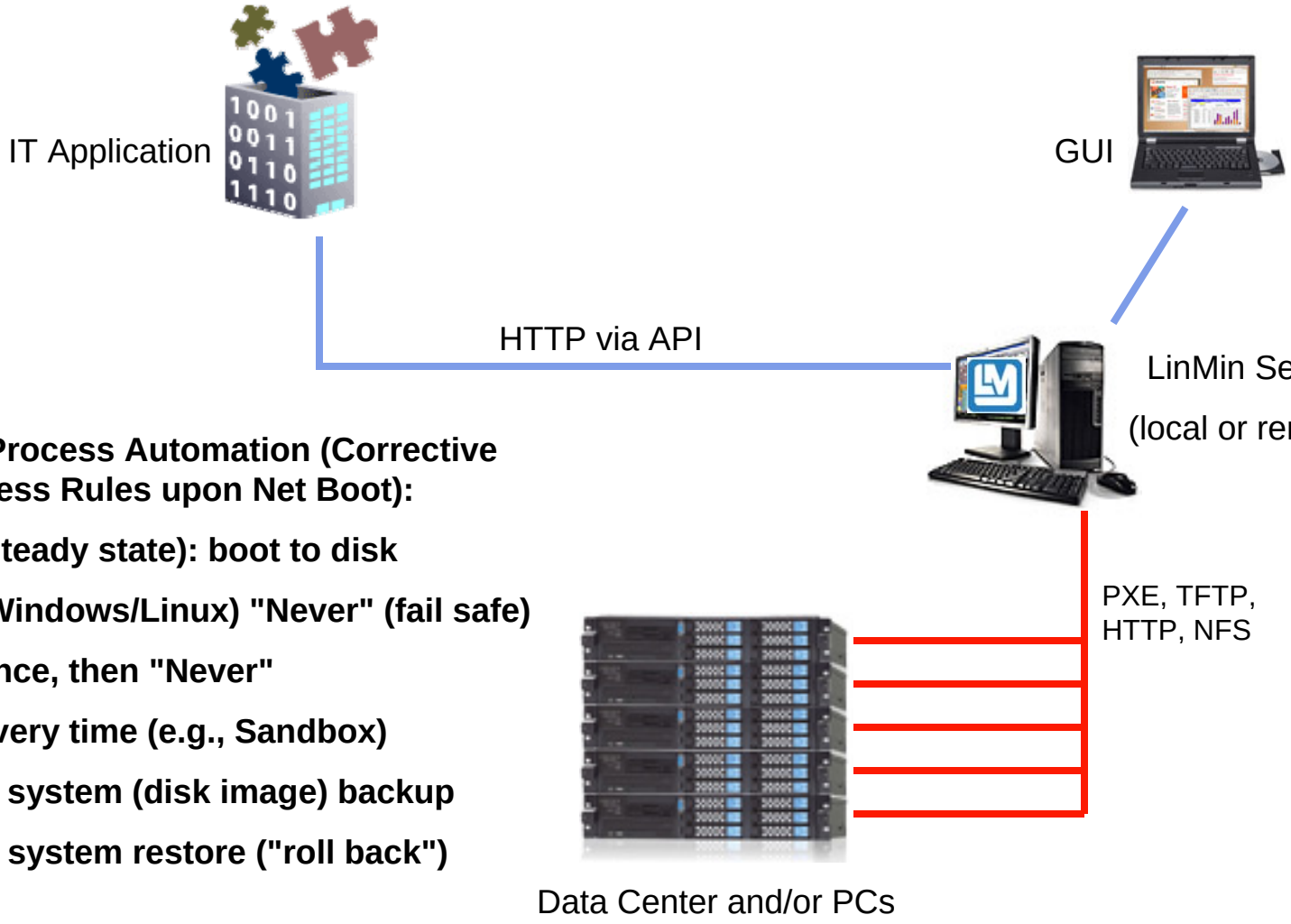
LinMin at a Glance

- IT Software that Controls the *Pre-Operating System Domain*
- Provisions (remotely installs) the Operating System
  - Windows, Linux (and applications, scripts, files)
  - Provisioning by Push (for Production) and Pull (for Sandbox or PC deployments)
- Images (disk capture and restore of) Windows, Linux
- For Physical or Virtual Systems
- Managed via GUI (browser) or API (HTTP)

LinMin Controls the Pre-OS Domain



Operational Process Automation (Corrective Action Business Rules upon Net Boot):

- **No action (steady state): boot to disk**
- **Provision (Windows/Linux) "Never" (fail safe)**
- **Provision once, then "Never"**
- **Provision every time (e.g., Sandbox)**
- **Perform full system (disk image) backup**
- **Perform full system restore ("roll back")**

LinMin Bare Metal Is Not:

- A Systems Management Framework
- A "Live System" (physical or virtual) Management Solution
- A System Monitoring Solution
- An Application Monitoring Solution
- A Patch Deployment Solution
- A System Resource Optimization Solution
- An Asset Discovery Solution
- The Best Way to Snapshot, Deploy and Clone Existing Virtual Clients

- Once LinMin has provisioned or imaged a physical or virtual system, your existing systems management infrastructure takes over…

LinMin Architecture and Operation

- Browser-based (for all routine operations/management)
- Scripts for occasional ISO file manipulations
- Database-driven (systems, roles, rules, etc.)
- File System for OS media, files, packages, applications, scripts and disk image snapshots
- Server-side Java services
- Application Programming Interface (API) to give external applications the ability to provision systems

Who Uses LinMin? Partial Customer List

LinMin Bare Metal Provisioning in 3 Steps

Upload into LinMin:

OS:
Red Hat®
Windows®
Novell®
Fedora
Ubuntu®
CentOS
Debian
Rescue System CD
+
Packages
Files
Applications
Configurations
Scripts
Images

Create "Roles" for "Push" & "Pull" Bare Metal Provisioning

Deploy to Physical and Virtual Machines

Steps: 1 2 3

Repeatability, Accuracy, Continuity in Bare Metal System Deployment

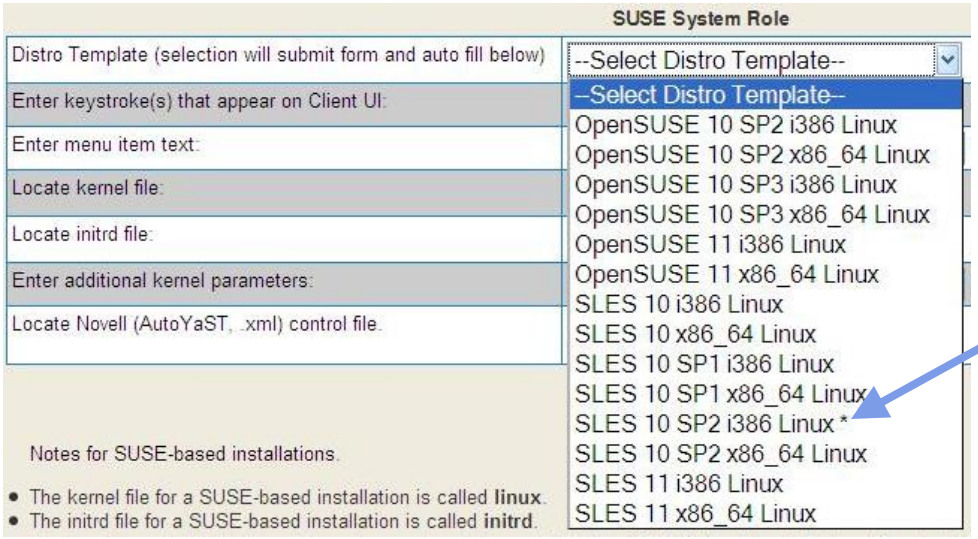
Provisioning Method 1: "Pull" Provisioning (MAC-Independent)

- Select OS & Profile to install from the client screen (up to 400 choices)
- MAC-Independent: no server-side setup needed for each client
- Ideal for desktop environments and for server sandboxes

```
F1 Help  F2  Options 1-16

            Welcome to the LinMin Bare Metal Provisioning Server

   *** Defaults to BH within 60 seconds
   BH: Boot to OS on hard drive
   1: Red Hat Enterprise Linux 5.4 i386 - Web Server
   2: Red Hat Enterprise Linux 5.4 x86_64 - Cloud Server
   3: Windows Server 2003 i386 - Web Server
   4: Windows Server 2008 R2 x86_64 - Enterprise Server
   5: Fedora 11 i386 Firewall
   6: CentOS 5.4 x86_64 - MySQL Server
   7: Debian 5.0.3 x86_64 Virtual Private Server Host
   8: SLES 11 x86_64 Linux - sles11_0_x86_64
   9: CentOS 5.4 x86_64 - Cloud Server
   10: Windows XP SP3
   11: Windows 7 Ultimate
   12: Windows 7 Enterprise
   13: OpenSUSE 11.1 i386 Workstation
   14: Ubuntu 9.10 x86_64 Karmic Koala Desktop

boot: _
```

"Pull" Provisioning: Point and Click to Create Novell SLES Provisioning Role

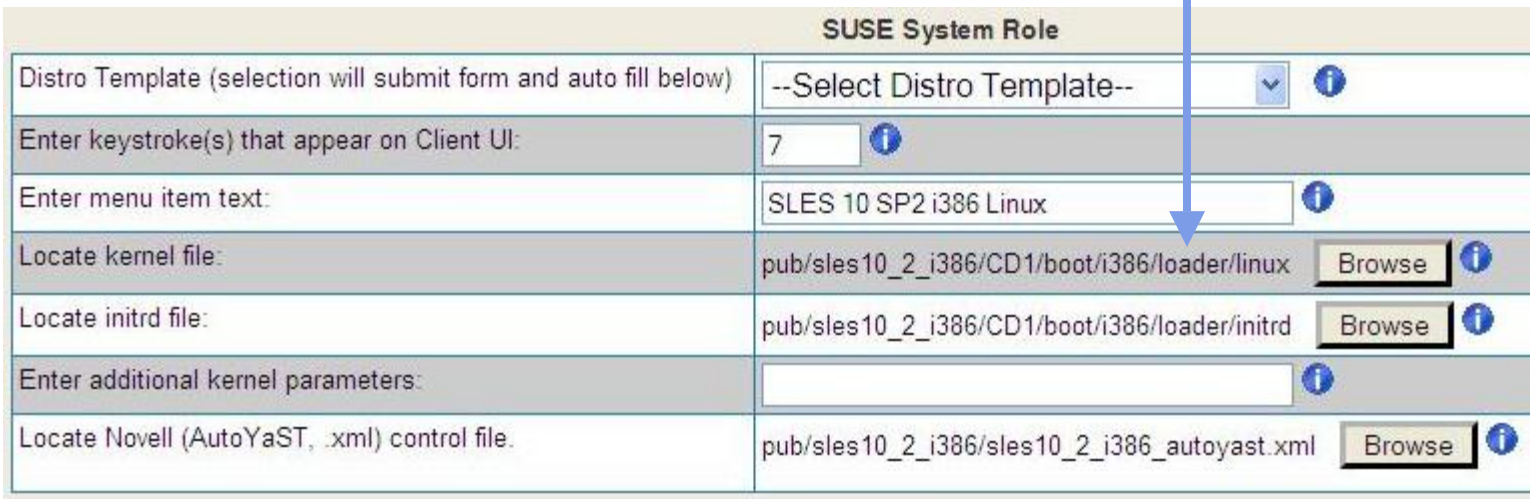
Step 1: Select



Asterisk shows that LinMin has detected that the OS media has been uploaded

LinMin automatically fills the form with path to kernel, RAM disk, configuration file and optional kernel parameters

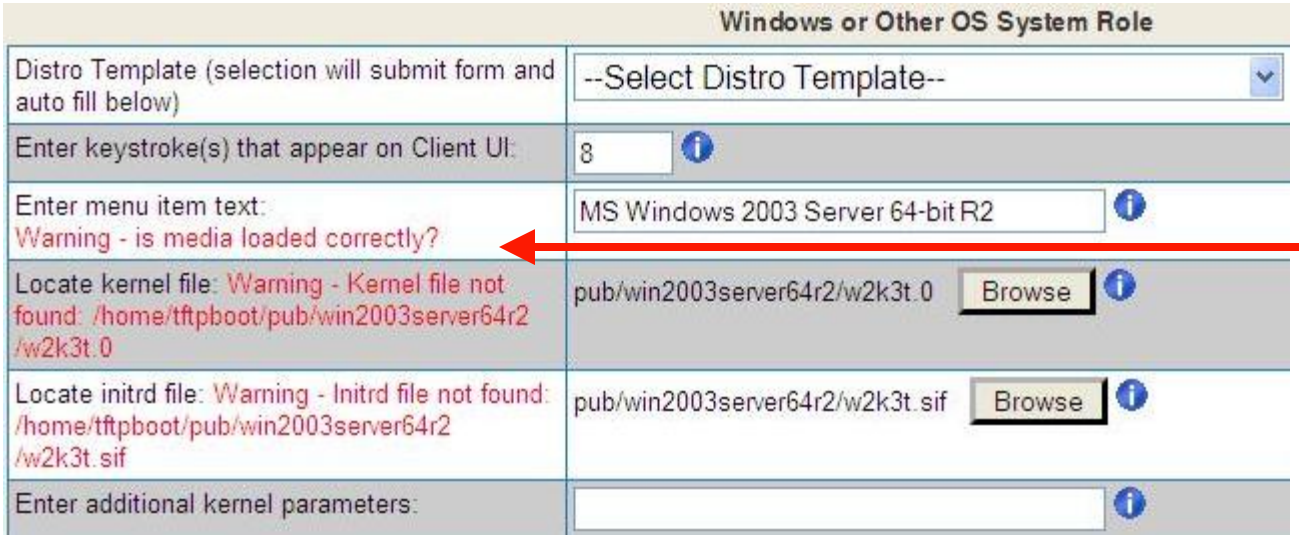
Step 2: Done!



"Pull" Provisioning: Point and Click to Create Windows Server Provisioning Role

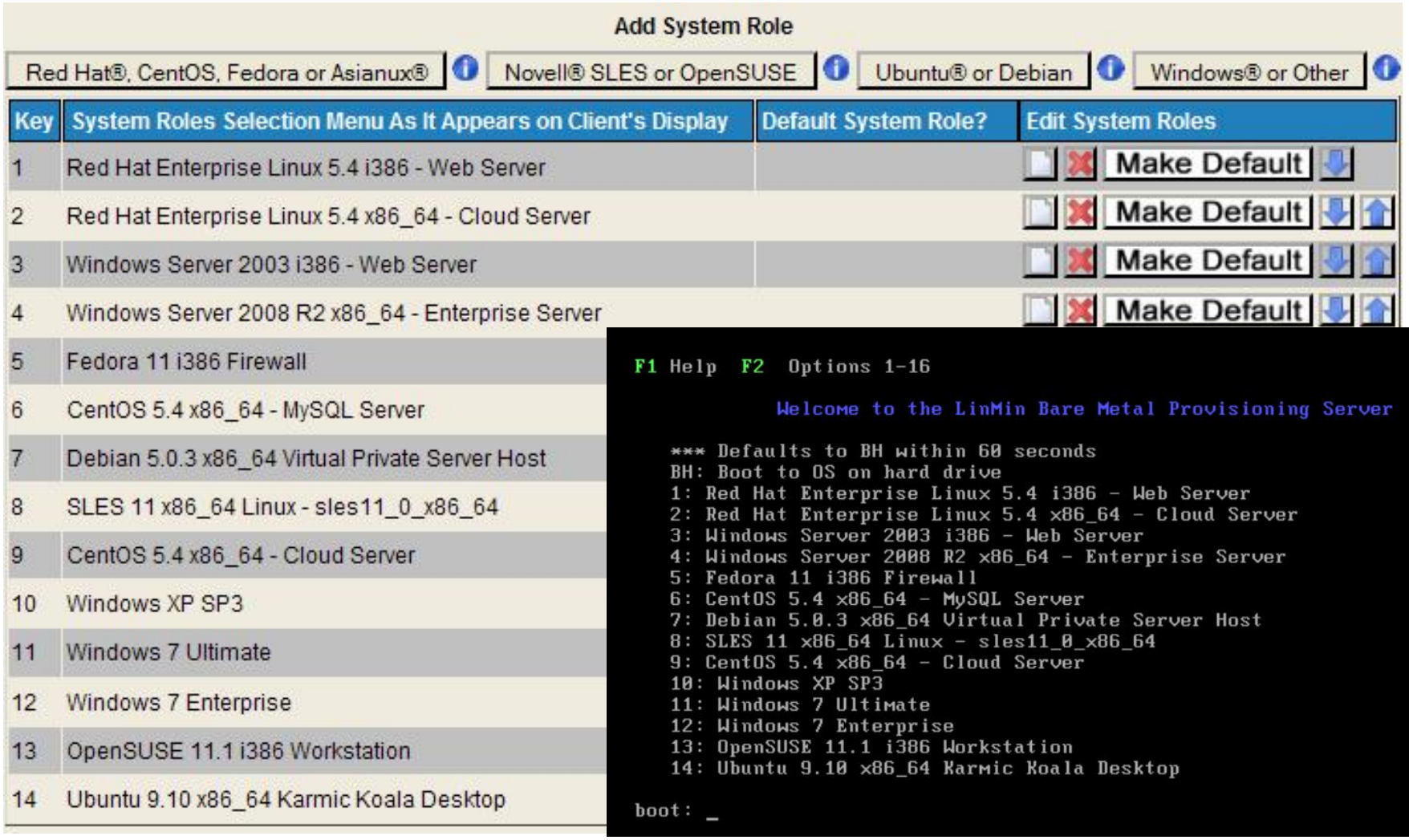
Step 1: Select

Step 2: Warning!



LinMin automatically detects that the OS media is missing and issues warnings

"Pull" Provisioning Roles Menu: Selections Will Appear on Client Screen

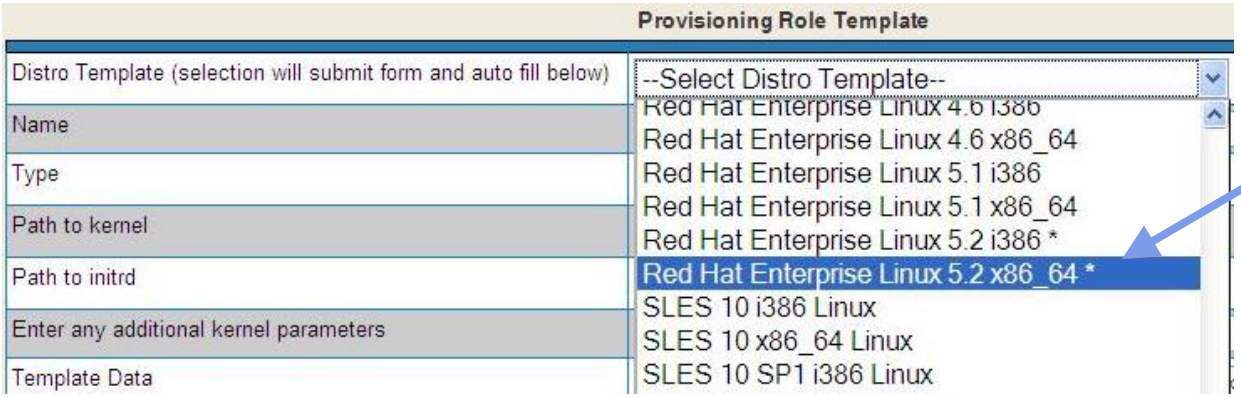


Provisioning Method 2: "Push" Provisioning (MAC-Specific)

- Gives IT Precise Control Over Each System
  - OS and Apps
  - Host name, password, network settings, time zone
- Lets IT Pre-Stage Systems for Repurposing
- Lets IT Decide What Actions a System Takes:
  - LinMin to ignore the system, tell it to boot from local disk (Safe Mode)
  - LinMin to provision each time a system boots to the network
  - LinMin to provision once, then go to "Safe Mode" (boot from HD)
- 2-Step Setup:
  - Create Provisioning Role Template(s)
  - Assign Templates and Unique Parameters to Systems

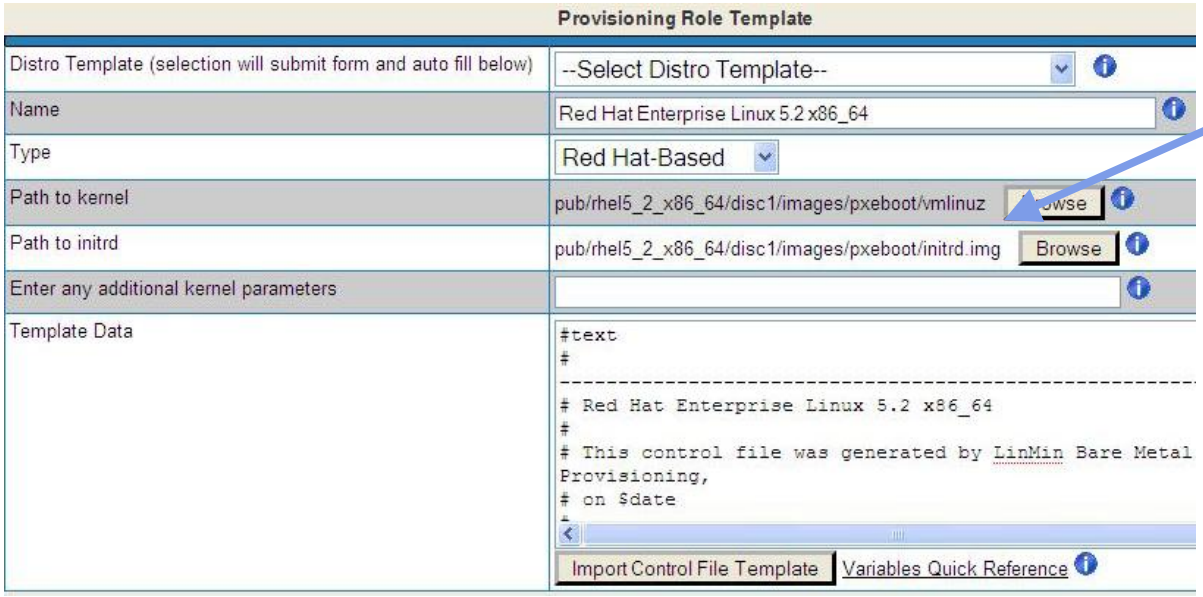
"Push" Provisioning
Step 1: Create Provisioning Role Templates

Step 1: Select



Asterisk shows that LinMin has detected that the OS media has been uploaded

Step 2: Done!



LinMin automatically fills the form with path to kernel, RAM disk, configuration file and optional kernel parameters

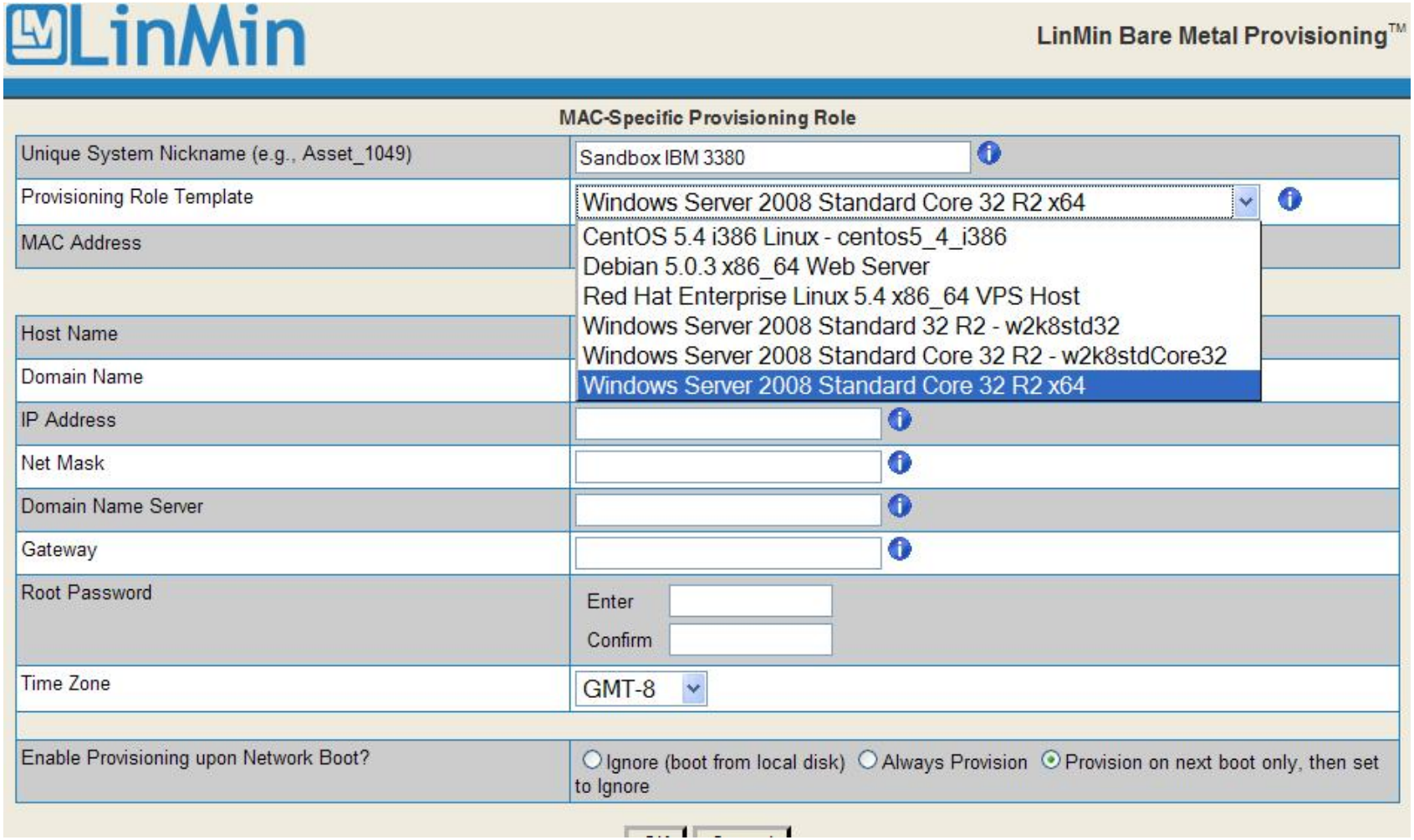
"Push" Provisioning
View All Provisioning Role Templates

Create a Provisioning Role Template

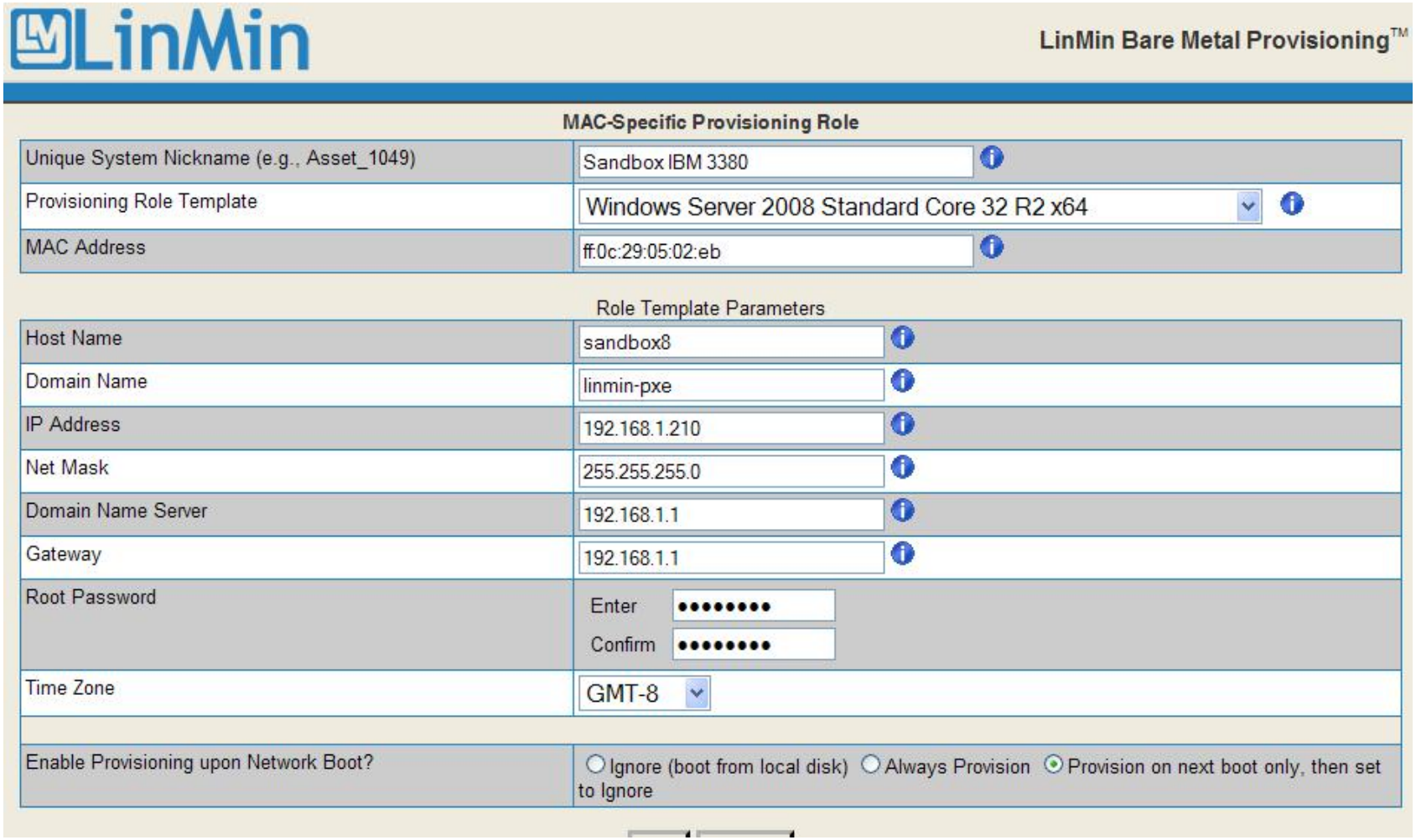
Template Name	Template Type	Edit/Copy/Delete
CentOS 5.4 i386 Linux - LAMP Stack	kickstart	
CentOS 5.4 x86_64 Linux - MySQL Server	kickstart	
Debian 5.0.3 i386 Web Server	debian	
Debian 5.0.3 x86_64 Virtual Private Server Host	debian	
Fedora 11 i386 Name Server	kickstart	
OpenSUSE 11.1 i386 Workstation - Solar Design	yast	
Red Hat Enterprise Linux 5.4 i386 - Light Server	kickstart	
Red Hat Enterprise Linux 5.4 x86_64 VPS Host	kickstart	
SLES 11 x86_64 SAP Server	yast	
Ubuntu 9.04.0 x86_64 MySQL Server	debian	
Windows 7 Ultimate	generic	
Windows Server 2003 R2 Enterprise	generic	
Windows Server 2008 R2 Standard	generic	

Create a Provisioning Role Template

"Push" Provisioning
Step 2a: Assign Template to a System



"Push" Provisioning
Step 2b: Assign Unique Settings to System



"Push" Provisioning
Dashboard: All Systems at a Glance

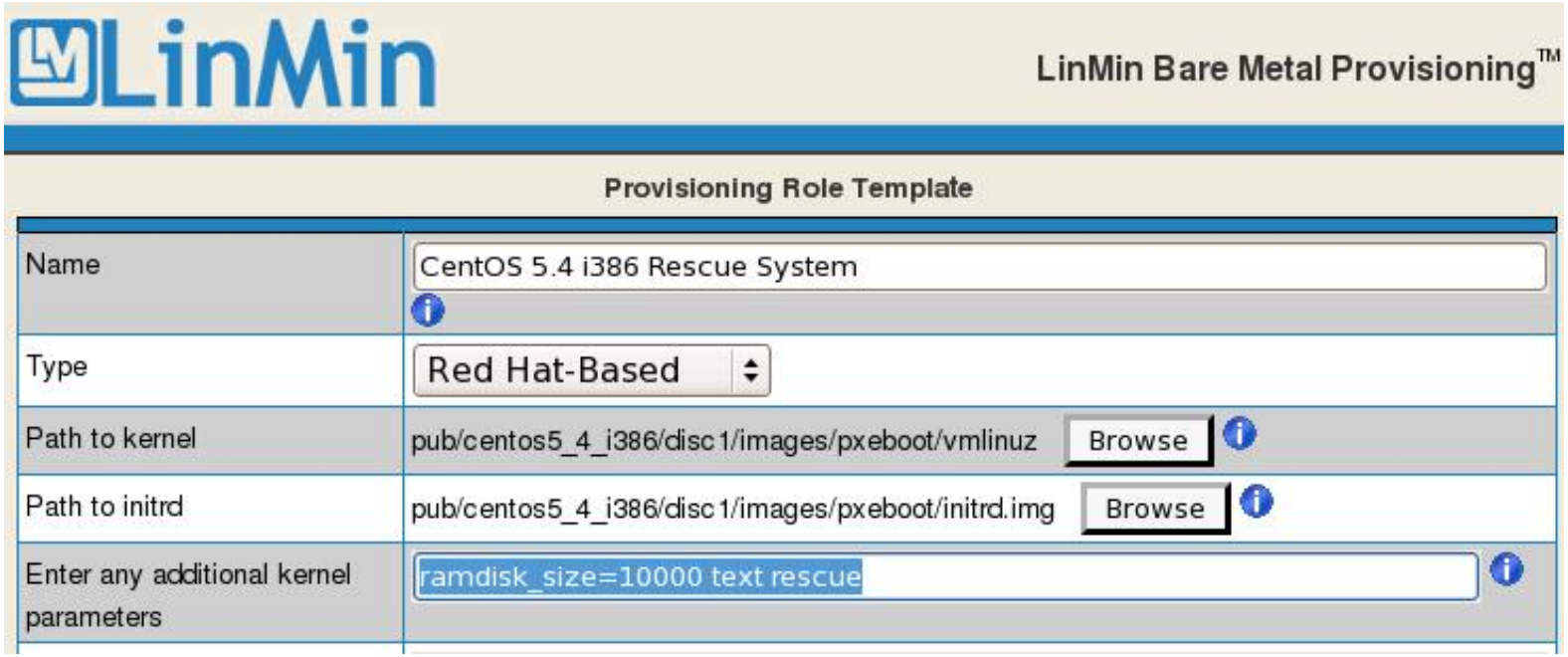
Add MAC-Specific Role

Nickname	Host Name	IP Address	MAC Address	Role Template	Provisioning	Edit/Copy/Delete
VPS490_IBM3340	VPS490_IBM3340	31.104.29.90	00:fb:02:a3:5d:aa	RHEL 5.4 x86_64 VPS Host	Ignore	
VPS491_IBM3340	VPS491_IBM3340	31.104.29.91	00:fb:02:a3:5d:a3	RHEL 5.4 x86_64 VPS Host	Next Boot	
Web117_DellR910	Web117_DellR910	31.104.30.117	00:02:55:b0:97:b3	Windows Server 2008 R2 Web	Next Boot	
Web118_DellR910	Web118_DellR910	31.104.30.118	00:02:55:b0:92:f4	Windows Server 2008 R2 Web	Ignore	
Web119_DellR910	Web119_DellR910	31.104.30.119	00:02:55:b0:4b:c9	Windows Server 2008 R2 Web	Ignore	
Web120_DellR910	Web120_DellR910	31.104.30.120	00:02:55:b0:42:9b	Windows Server 2008 R2 Web	Ignore	
Web121_DellR910	Web121_DellR910	31.104.30.121	00:02:55:b0:92:f7	Windows Server 2008 R2 Web	Next Boot	
Web122_DellR910_Test	Web122_DellR910	31.104.30.122	00:02:55:b0:92:d6	Windows Server 2008 R2 Web	Always	
Web123_HPSL270z	Web123_HPSL270z	31.104.30.123	00:2f:04:bf:c3:d9	RHEL 5.4 i386 - Light Server	Ignore	
Web124_HPSL270z	Web124_HPSL270z	31.104.30.124	00:2f:04:bf:c3:ca	RHEL 5.4 i386 - Light Server	Ignore	
Web125_HPSL270z	Web125_HPSL270z	31.104.30.125	00:2f:04:bf:c3:a3	RHEL 5.4 i386 - Light Server	Ignore	
Web126_HPSL270z	Web126_HPSL270z	31.104.30.126	00:2f:04:bf:c3:d1	RHEL 5.4 i386 - Light Server	Next Boot	
Web127_HPSL270z	Web127_HPSL270z	31.104.30.127	00:2f:04:bf:c3:d7	RHEL 5.4 i386 - Light Server	Ignore	
Web128_HPSL270z	Web128_HPSL270z	31.104.30.128	00:2f:04:bf:c3:fc	Debian 5.0.3 i386 Web Server	Ignore	
Web129_HPSL270z	Web129_HPSL270z	31.104.30.129	00:2f:04:bf:c3:c1	Debian 5.0.3 i386 Web Server	Ignore	
Web130_HPSL270z	Web130_HPSL270z	31.104.30.130	00:2f:04:bf:c3:c0	Debian 5.0.3 i386 Web Server	Next Boot	

- **Each system will be provisioned with a pre-determined profile (OS, web/app/DB server, workstation)**
- **Full hardware discovery is performed such that the client systems can have different CPU types, NICs, RAM, discs, etc.**

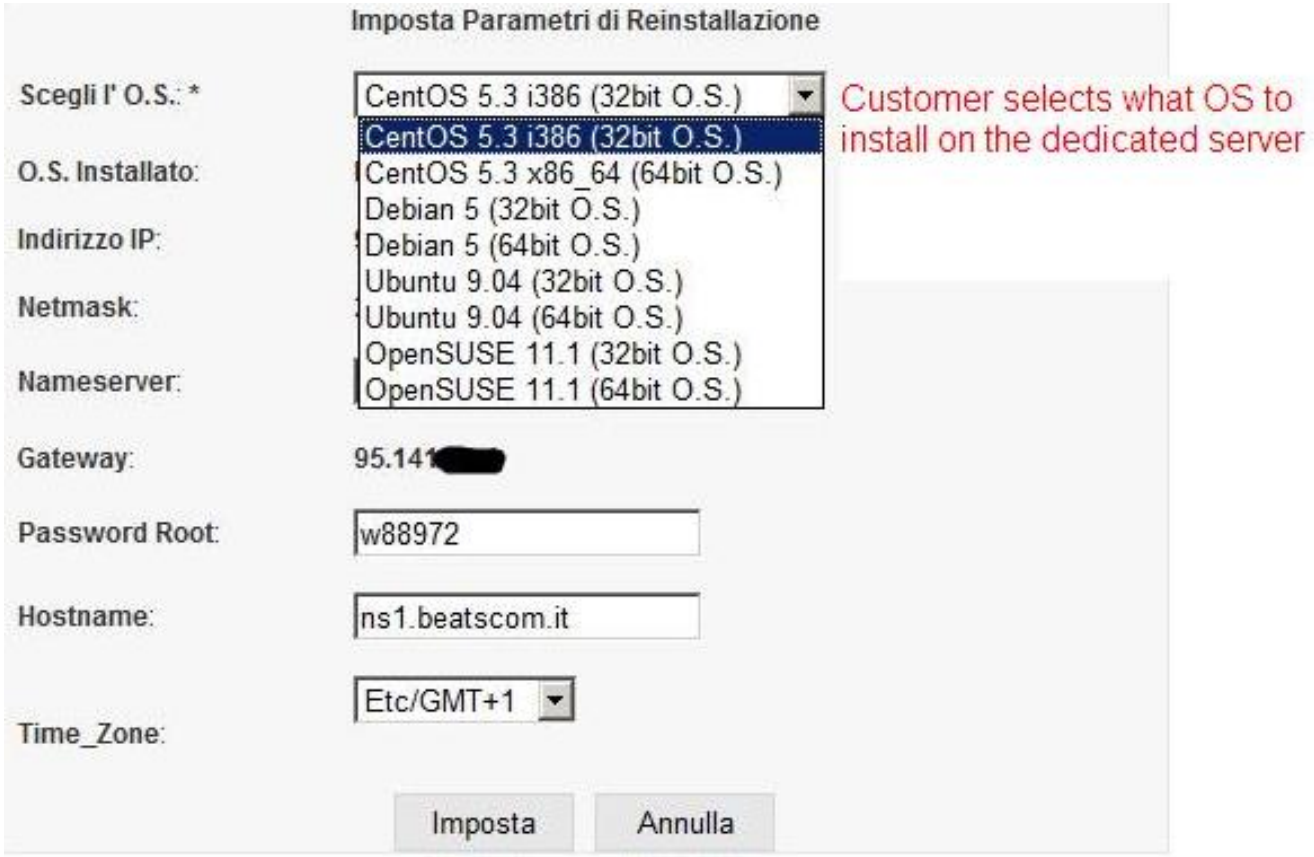
LinMin Also Provisions Rescue System CDs

- For remote repair of systems



LinMin API
Application Programming Interface

- For integrating provisioning functionality into your apps
- Example: hosting control panel (below), load balancing app



LinMin API
Application Programming Interface

- "Teaching Mode" generates working API code for easy implementation

Results of previous action - "" (actionResults and actionResultsMsg)	
REQUIRED: One for all actions, both for Add action	Key values -- one required for all actions, both required for add action, both allowed for any action
Unique System Nickname (user_supplied_id)	
MAC Address (mac_address)	
OPTIONAL: Update action only	Change existing key values, valid only with update action --
New System Nickname (new_user_supplied_id)	()
New MAC Address (new_mac_address)	()
REQUIRED: for Add action OPTIONAL: for other actions	Role Template Parameters, for Add and Update actions
Provisioning Role Template (control_file_template)	
Host Name (node_name)	
Domain Name (node_domain)	
IP Address (node_ip_address)	
Net Mask (node_subnet_mask)	
Domain Name Server (node_nameserver)	
Gateway (node_default_gateway)	
Root Password (node_password)	()
Time Zone (node_time_zone)	()
Enable Provisioning upon Network Boot? (enable_provisioning_flag)	○Ignore (boot from local disk) ○Always Provision ○Provision on next boot only, then set to Ignore ()
Action (action)	◉Read ○Update ○Add ○Delete ()
Debug (debug) GET option shows input and output HTTP GET strings	◉No ○Show ○GET
	Submit Reset Clear

"I use Virtualization: Why do I need LinMin?"

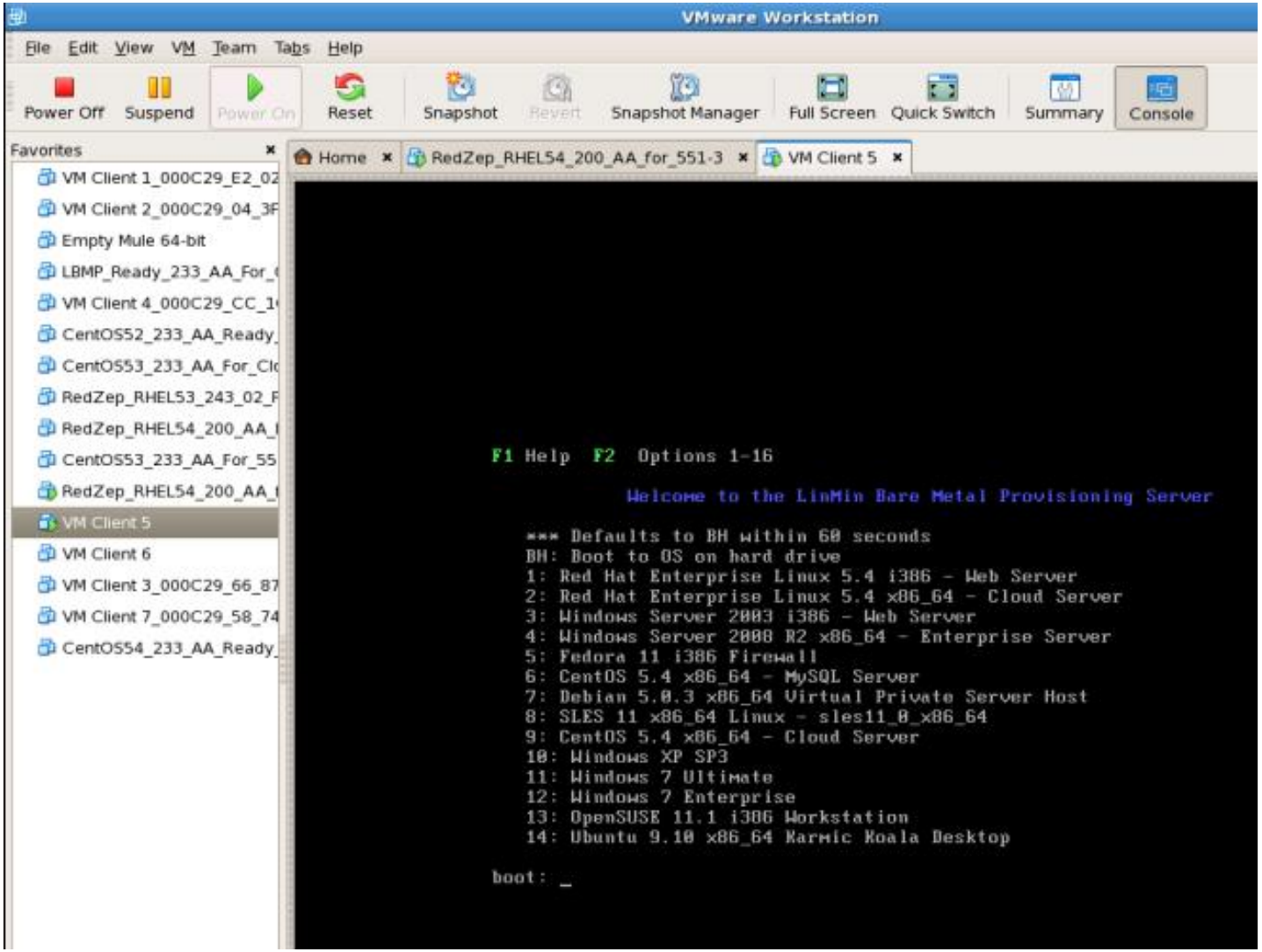
With LinMin, you don't need DVDs/CDs, and you can refine, then repeat:

- Create "Logical Golden Images" (Provisioning Role Templates)
- Provision Physical and Virtual systems with the same Role
- Imaging a physical system, a Host hypervisor or a Virtual Client is the same

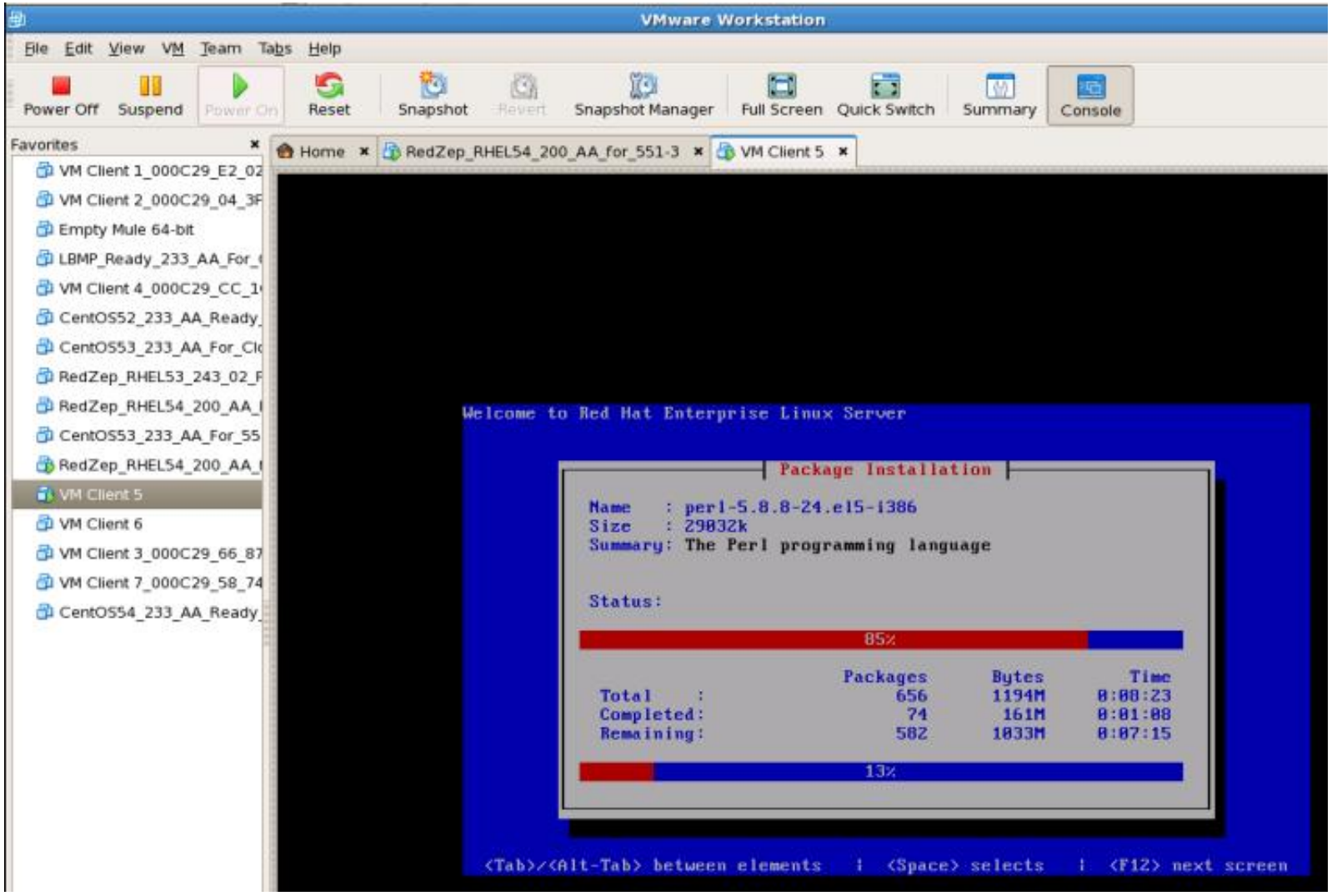
- Use LinMin to create, fine-tune and test "that first VM" for a given Role
- Use LinMin to maintain the "Logical Golden Image" for each Role

- Once you have deployed "that first VM" for a given role into your virtualized environment using LinMin, use your native virtualization tools to snapshot, clone and deploy these VMs

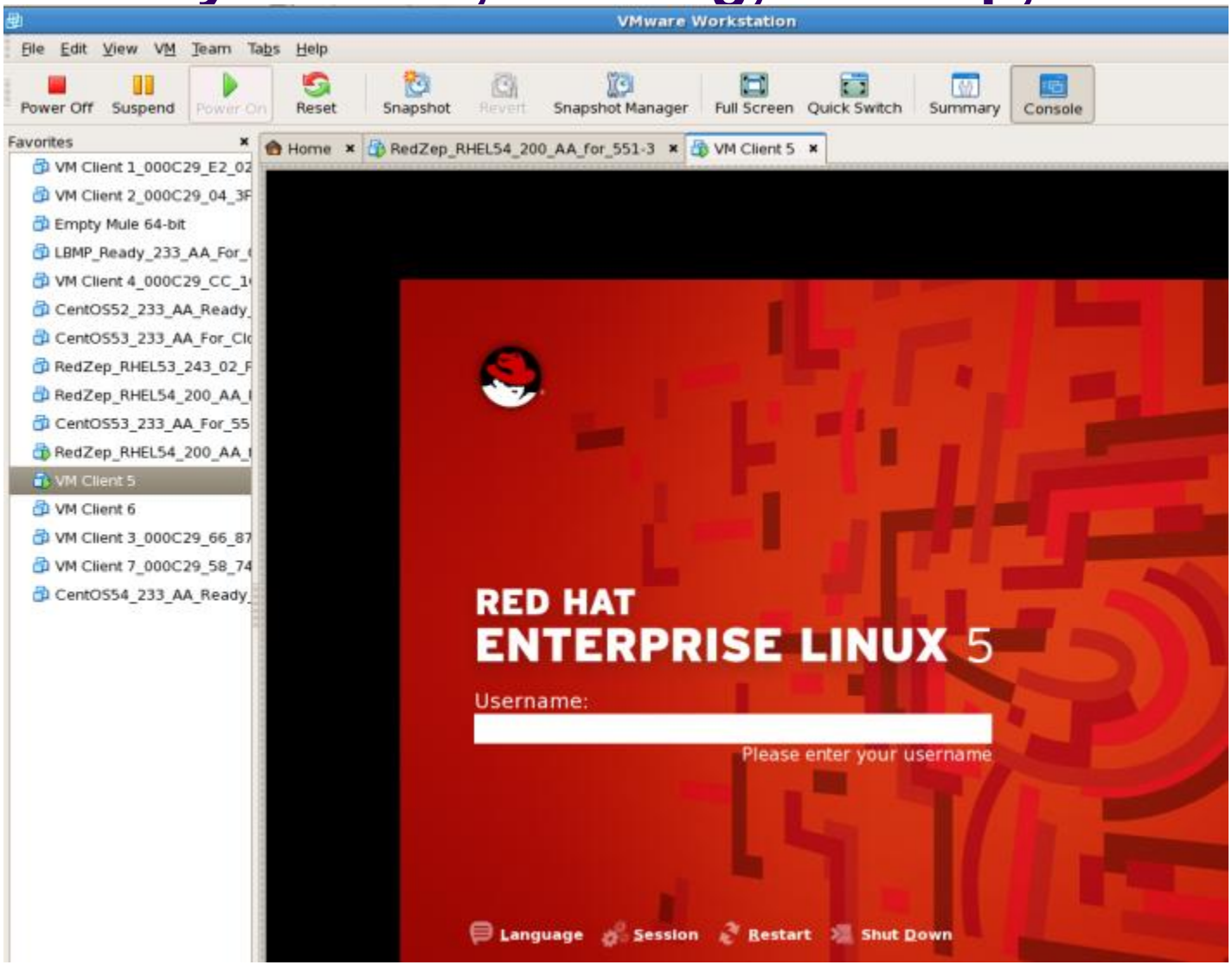
VMware Example: "Push" Provisioning



VMware Example:
Red Hat Enterprise Linux Being Provisioned



VMware Example:
VM Ready for Use, Cloning, Backup, etc.

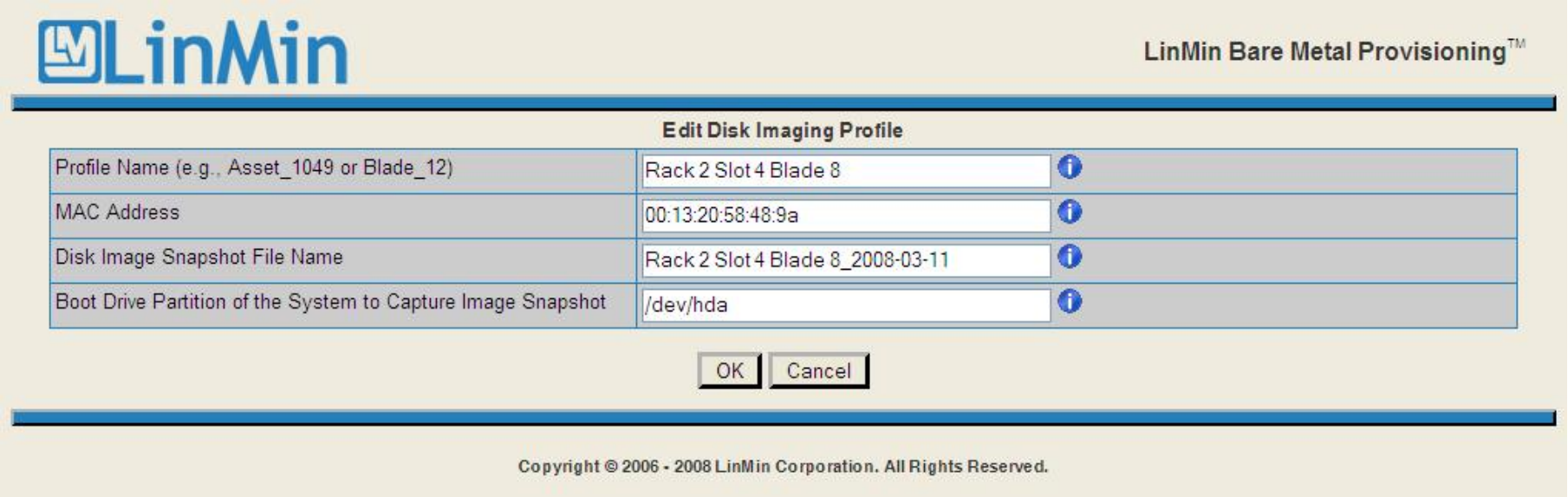


Disk Imaging

Imaging Rules: Backup, Restore, Clone

- **IT Staff Configures "Next Network Boot" snapshot/rollback profiles through the Browser-based GUI**
- **Profiles can be easily copied to reduce configuration time and possible errors**
- **Systems can be restored to a fully "known-good" point in time upon IT request**
- **System-Specific (tied to MAC address) "Hardware Specific Snapshot/Rollback"**
- **Complements (does not replace) file-based backup/restore solutions**

Imaging Role Example



- **IT Staff Pre-configures snapshot/rollback profiles through the Browser-based GUI**
- **Each system will have all its partitions backed up and stored on the network**
- **Systems can be restored to a fully "known-good" point in time upon IT request**
- **Since the OS is not running during snapshots, full file/service/database integrity is ensured**
- **System-Specific (tied to MAC address) "Hardware Specific Backup/Restore" = Snapshot/Rollback**
- **Can be used to clone systems with identical hardware**

Which Approach to Use When?

- "Pull": MAC-Independent Provisioning
  - ✓ When many systems have the same OS/App requirements with DHCP IP addressing (Desktops, servers in a sandbox)
  - ✓ When client-side users need to be given the choice of working OS & configurations (e.g., built-to-order; employee desktop rollouts)

- "Push", MAC-Specific Provisioning
  - ✓ When deterministic control over selected systems' configuration is needed ("This system will always have this OS/Distro, these applications, this IP address and be configured just so, regardless of its hardware")

- Imaging and Snapshot/Rollback
  - ✓ When all system OS, Apps, data and system state needs to be restored to a known-good state, or to clone to like systems

Alternatives to LinMin Bare Metal

- Install from Physical Media (CD-ROM/DVD)
  - Pros: it's simple, it works
  - Cons: time consuming (human and elapsed), non repeatable, error prone, requires manual installation of applications and manual system configuration
- Open Source "Build Your Own" Provisioning Solution
  - Pros: Enticing on paper (zero software cost), fun to build
  - Cons:
    - Labor Costs to Build, Configure, Test and Maintain
    - Time to Implement and Cost to Maintain
    - No predictable commercial technical support
- Other Commercial Provisioning Solutions
  - Pros: Highly sophisticated and capable
  - Cons:
    - Price (10x to 30x more expensive than LinMin)
    - Longer learning curve and implementation times
    - Limited Linux options; no disk imaging; "heavy" solutions

Analyst and Customer Quotes…

"LinMin is doing for the system provisioning space what Henry Ford did to the automobile industry: they introduced a product that works, is reliable and that everybody can afford."

Industry Analyst

"I installed LinMin in just a few minutes and immediately started to provision dozens of Linux blades. LinMin is easy to use and allows me not to have to set foot in my data center. It saves me incredible amounts of time while giving me full control over how each system is provisioned. And with its incredibly low price, LinMin paid for itself in a few days."

Customer

Next Steps

- Learn more: http://www.LinMin.com/
- Start today: On-line Store
- Not sure? Download Trial Version