

Super PXE Server (SPS) - Comprehensive Enterprise Manual

Welcome to the official manual for the **Super PXE Server (SPS) v4.1.0**. SPS is a next-generation, zero-trust network boot appliance designed to fundamentally modernize how enterprises, educational institutions, and IT professionals deploy and manage operating systems at scale.

This manual covers the Enterprise feature set available within the Web Console.

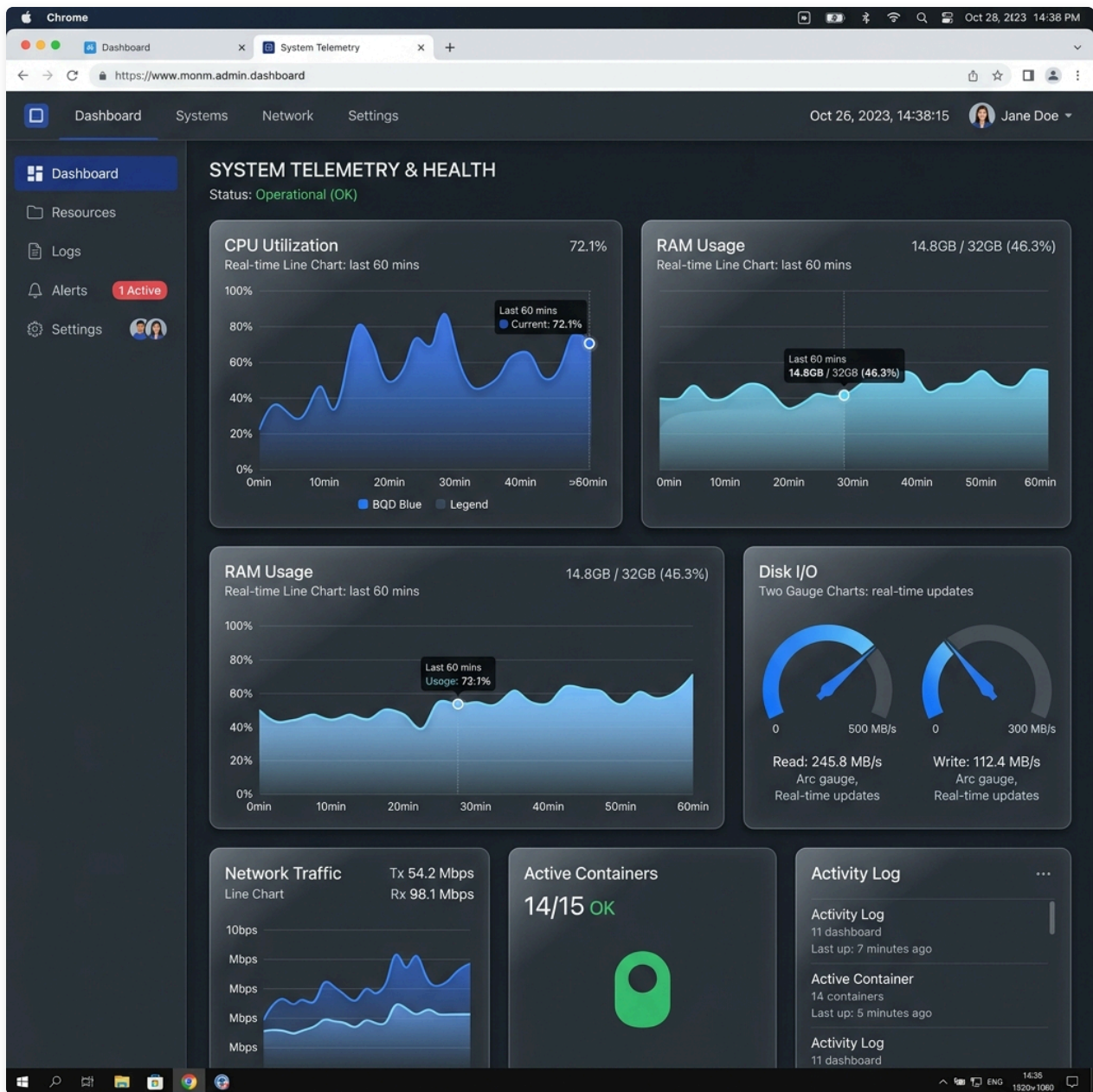
1. System Telemetry & Network Clients

The core dashboard gives you a bird's-eye view of your entire infrastructure.

System Telemetry & Health

Monitor the raw performance of the SPS host server in real-time.

- **CPU Utilization:** Tracks the Go/Python split architecture overhead.
- **RAM Usage:** Crucial for monitoring Live ISO extraction into tmpfs.
- **Disk I/O Throughput:** Measures the speed of iSCSI and NFS streaming to connected endpoints.

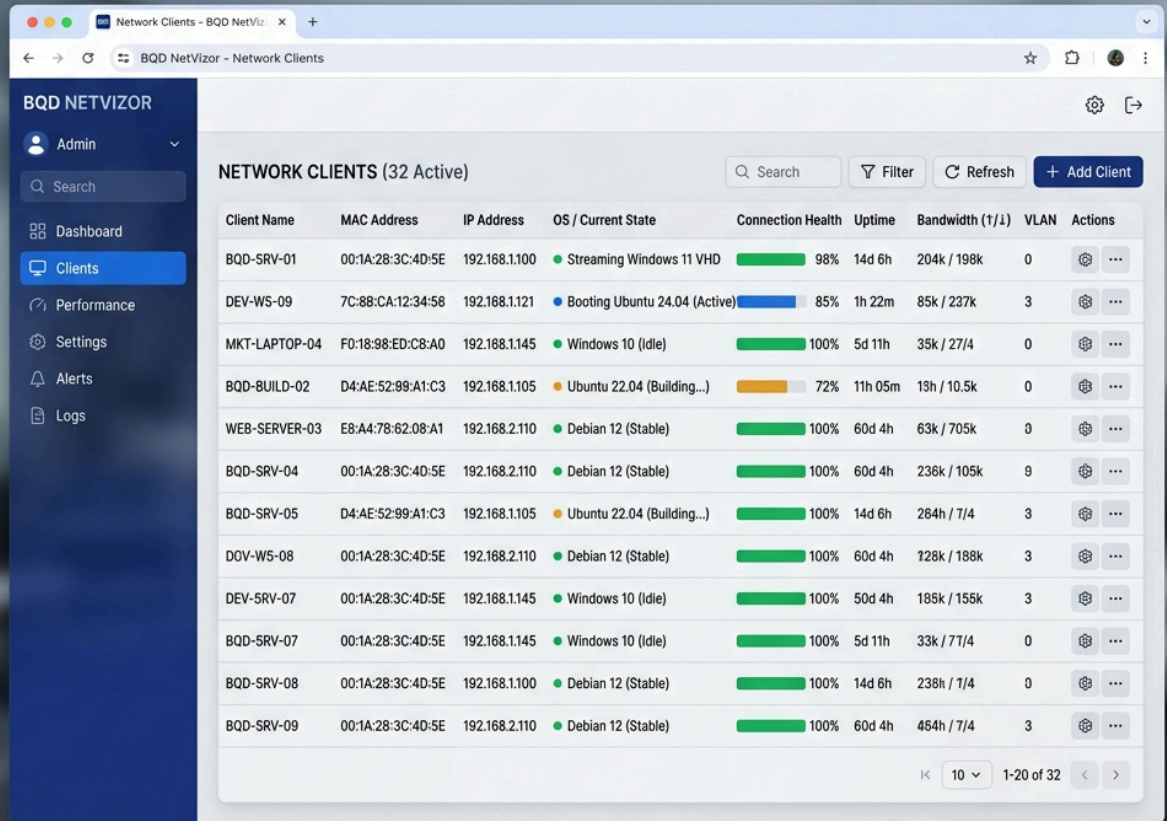


Network Clients & Deployment Progress

This tab provides a stateful overview of all active machines on the LAN.

- **Active Node Table:** See MAC addresses, IP leases, and precise OS states (e.g., *Streaming Windows 11 VHD*).
- **Deployment Progress:** When copying local installations, track the exact transfer speed (MB/s) and estimated time to completion (ETA).

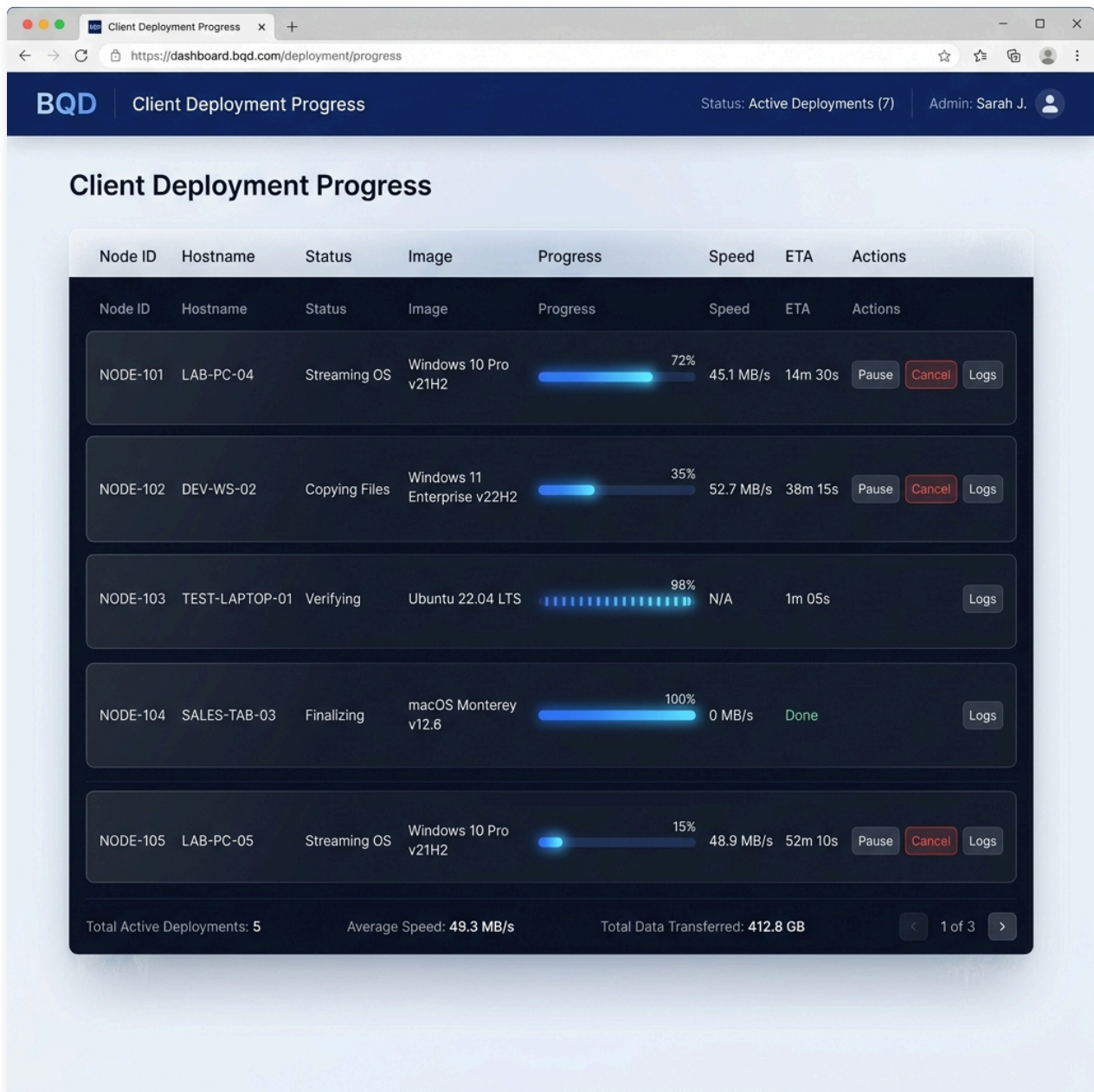
- **Connection Health:** Identify bottlenecked endpoints with slow negotiated link speeds.



The screenshot displays the BQD NetVizor web interface for managing network clients. The left sidebar contains navigation links for Admin, Search, Dashboard, Clients (selected), Performance, Settings, Alerts, and Logs. The main content area is titled 'NETWORK CLIENTS (32 Active)' and includes a search bar, filter, refresh button, and an 'Add Client' button. Below this is a table listing 12 clients with their respective details.

Client Name	MAC Address	IP Address	OS / Current State	Connection Health	Uptime	Bandwidth (t/l)	VLAN	Actions
BQD-SRV-01	00:1A:28:3C:4D:5E	192.168.1.100	● Streaming Windows 11 VHD	98%	14d 6h	204k / 198k	0	⚙️ ⋮
DEV-WS-09	7C:88:CA:12:34:58	192.168.1.121	● Booting Ubuntu 24.04 (Active)	85%	1h 22m	85k / 237k	3	⚙️ ⋮
MKT-LAPTOP-04	F0:18:98:ED:C8:A0	192.168.1.145	● Windows 10 (Idle)	100%	5d 11h	35k / 27/4	0	⚙️ ⋮
BQD-BUILD-02	D4:AE:52:99:A1:C3	192.168.1.105	● Ubuntu 22.04 (Building...)	72%	11h 05m	19h / 10.5k	0	⚙️ ⋮
WEB-SERVER-03	E8:A4:78:62:08:A1	192.168.2.110	● Debian 12 (Stable)	100%	60d 4h	63k / 705k	0	⚙️ ⋮
BQD-SRV-04	00:1A:28:3C:4D:5E	192.168.2.110	● Debian 12 (Stable)	100%	60d 4h	236k / 105k	9	⚙️ ⋮
BQD-SRV-05	D4:AE:52:99:A1:C3	192.168.1.105	● Ubuntu 22.04 (Building...)	100%	14d 6h	264h / 7/4	3	⚙️ ⋮
DOV-WS-08	00:1A:28:3C:4D:5E	192.168.2.110	● Debian 12 (Stable)	100%	60d 4h	128k / 188k	3	⚙️ ⋮
DEV-SRV-07	00:1A:28:3C:4D:5E	192.168.1.145	● Windows 10 (Idle)	100%	50d 4h	185k / 155k	3	⚙️ ⋮
BQD-SRV-07	00:1A:28:3C:4D:5E	192.168.1.145	● Windows 10 (Idle)	100%	5d 11h	33k / 77/4	0	⚙️ ⋮
BQD-SRV-08	00:1A:28:3C:4D:5E	192.168.1.100	● Debian 12 (Stable)	100%	14d 6h	238h / 1/4	0	⚙️ ⋮
BQD-SRV-09	00:1A:28:3C:4D:5E	192.168.2.110	● Debian 12 (Stable)	100%	60d 4h	454h / 7/4	3	⚙️ ⋮

At the bottom right of the table, there is a pagination control showing '10' items per page and '1-20 of 32' total items.



2. Server Configuration & Networking

SPS is designed to seamlessly integrate into existing corporate networks without disrupting current infrastructure. Basic networking and Secure Boot features are fully unlocked in the Community Tier.

Server Settings & DHCP/TFTP (Community Tier)

- **Interface Selection:** Bind SPS exclusively to specific NICs (e.g., `eth1` for the imaging VLAN).
- **Secure Boot EFI Selection:** Easily select between `shim.efi` (Secure Boot enabled), `ipxe.efi`, or Legacy SNP boot files.
- **TFTP Block Sizes:** Tune MTU window sizes for faster initial `ipxe.efi` handoffs.

- **ProxyDHCP Toggle:** If enabled, SPS will *not* act as the primary router. Instead, it listens for DHCP broadcasts and injects boot instructions alongside your existing enterprise DHCP server (Cisco/Meraki/pfSense).
- **DHCP Leases & Scopes:** View currently assigned temporary IPs, adjust lease times, and configure Subnet/Gateway/DNS routing.

BQD Provisioning

Dashboard

Images

Configurations

Deployment

Search

Calendar

Notifications

Alex Chen

Home / Configurations / Server Settings

Settings

Server Configuration

Manage essential settings for PXE, TFTP, and network parameters.

General Settings

Toggle Switch

Toggle Switch (Active, BQD Blue).

Active

Enable PXE Service

Toggle PXE Service: Toggle: #1E3A8A.

ON

Network Settings

Server IP Address

192.168.1.50

Required for TFTP/PXE.

Interface Selection

eth0 (10GbE)

eth0

eth1

bond0

TFTP Configuration

Enable TFTP Server

Enable TFTP Server for Toggle; #1E3A8A.

ON

TFTP Block Size

TFTP Block Size bytes 512, dropdows, 80itless, and dropdovrs.

8192 Bytes

512

1024

2048

4096

8192

TFTP Port

69

Input on TFTP Port.

TFTP Root Directory

/var/lib/tftpboot

Input root Directory i: /var/lib/t

DHCP Settings

Enable DHCP Relay

Enable DHCP relay to Toggle: BHCP settings.

OFF

Boot Configuration

Default Bootfile

undionly.kpxe

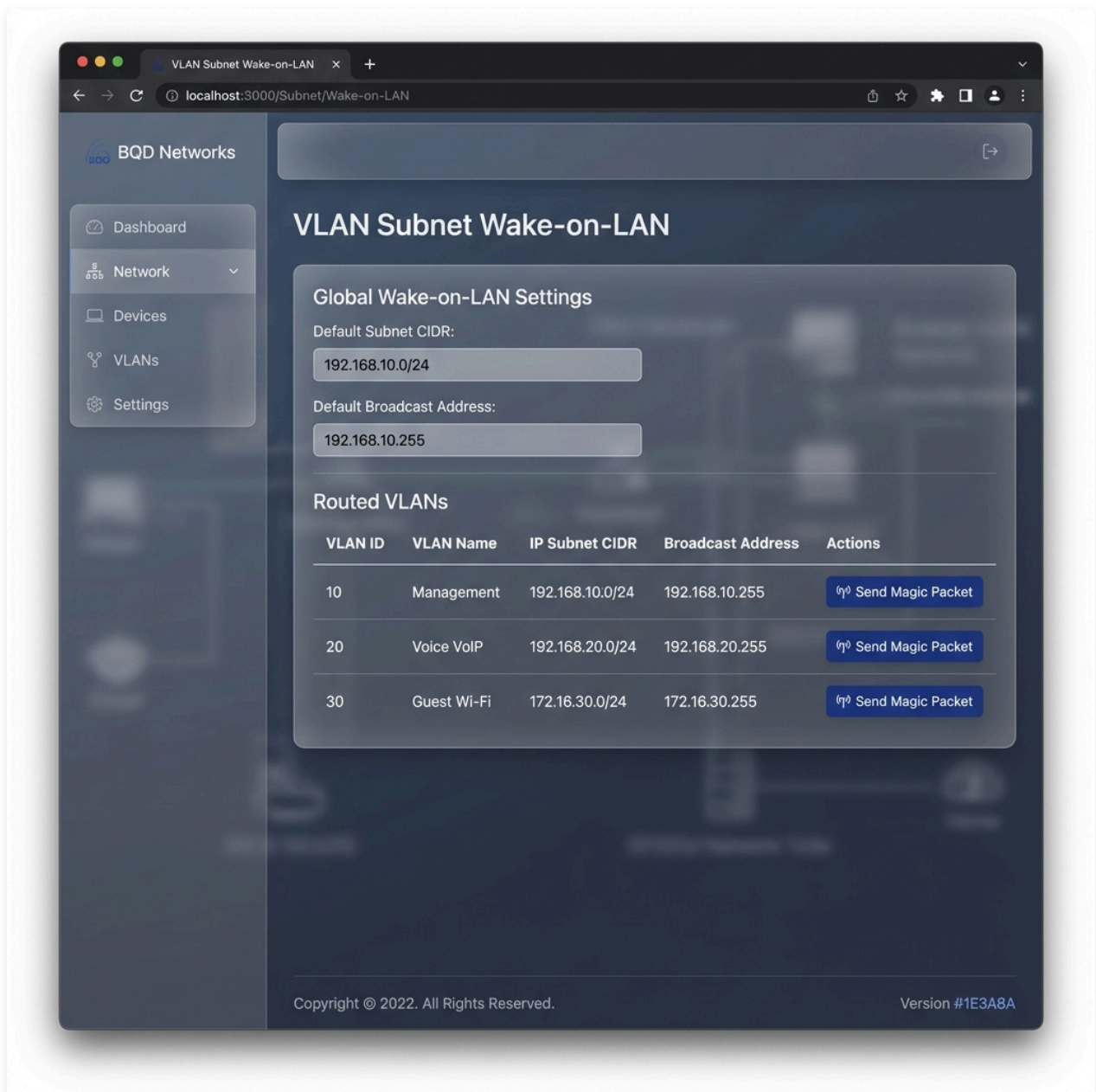
Default Bootfile: undionly.kpxe.

<<

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192.168.10.255) so a targeted UDP blast can reach isolated labs.

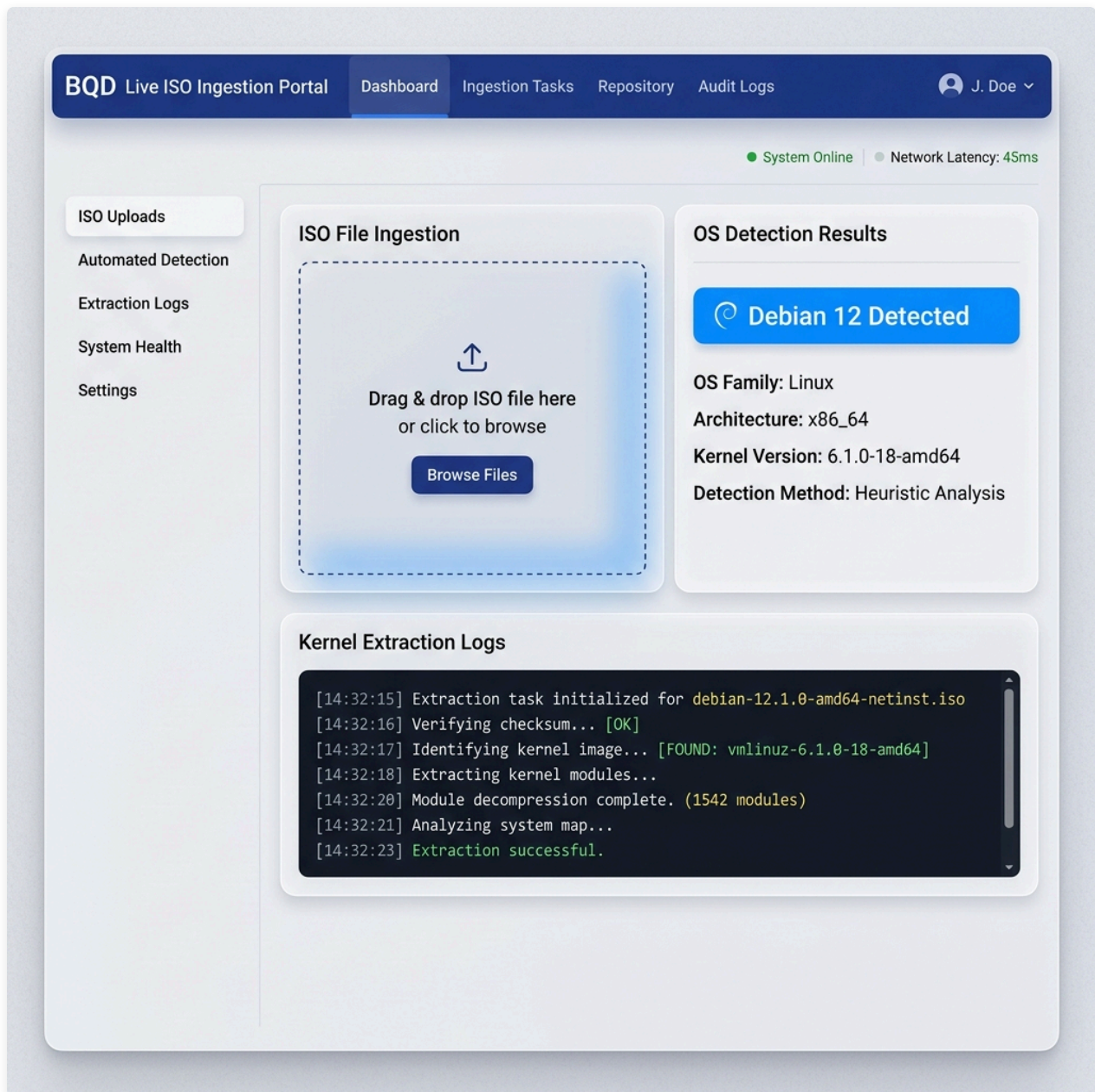


3. Boot Assets & Storage Solutions

SPS excels at ingesting, organizing, and streaming OS payloads.

Live ISO Ingestion Portal

- **Drag-and-Drop:** Simply drag a Linux Live ISO or Windows PE image onto the portal.
- **Auto-Detection:** The Python backend dynamically analyzes the ISO to detect the OS family (e.g., Ubuntu, Debian, Windows).
- **Kernel Extraction:** SPS automatically extracts the `vmlinuz` and `initrd` files required to generate the dynamic PXE menus.



Virtual Hard Drive (VHD) Manager & Ephemeral Overlays

- **Master Images:** Upload fixed or dynamic `.vhdx` / `.vhd` files.
- **Diskless Overlays:** SPS can boot hundreds of clients from a single Master VHD by utilizing Ephemeral Overlays (Copy-on-Write).
- **Merge / Discard:** Choose whether changes made by the client are permanently merged back into the Master VHD, or discarded upon reboot to maintain a pristine image state.



Dashboard

Dashboard

My VHDs

Master Images

Differentials

Settings

Manage Virtual Hard Drives

Create Differential VHDX

Drag & drop files here or click to upload

Choose File

Choose File

Search Master Images...

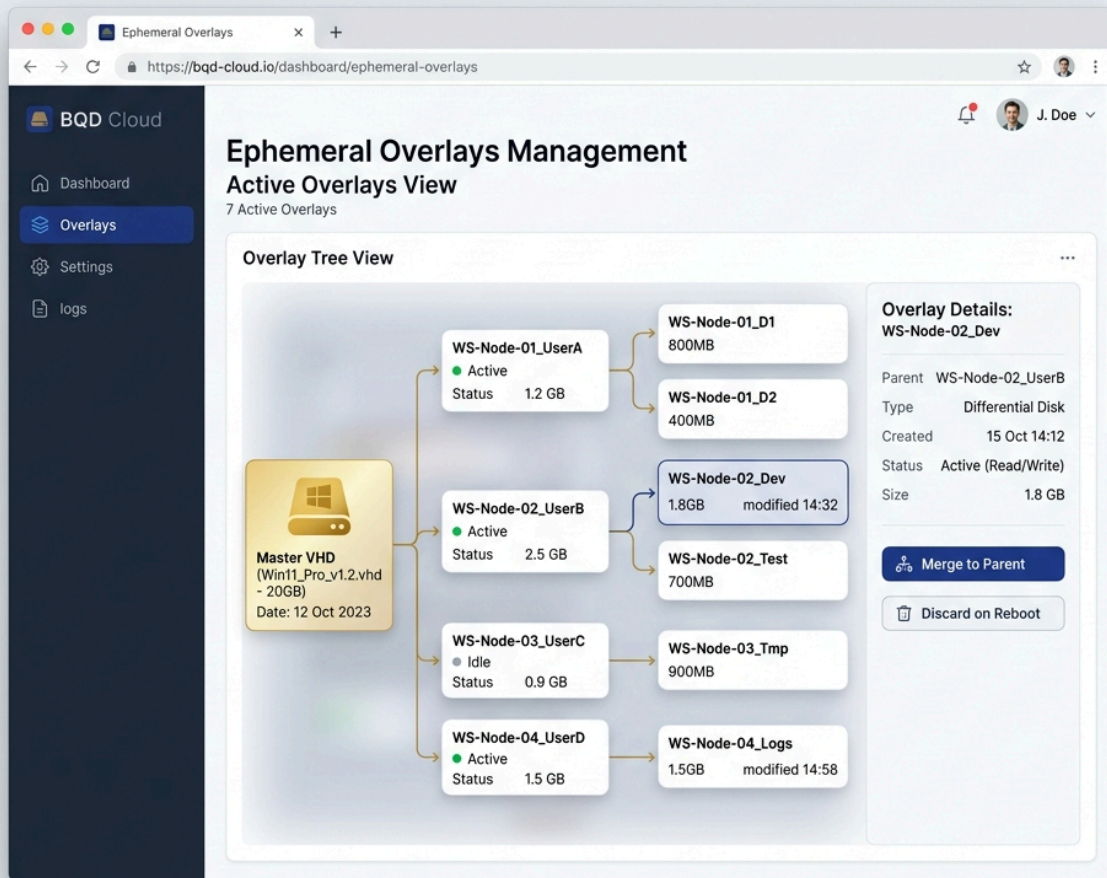
File Name	Format	Size	Created On	Actions
Win10_Golden.vhdx	.vhdx	45 GB	Oct 26, 2023	
Ubuntu_Server.vhd	.vhd	20 GB	Nov 5, 2023	

Creating Differential Overlay: Win10_Golden_Diff_20231115

Status: Syncing blocks... Time remaining: ~2 mins

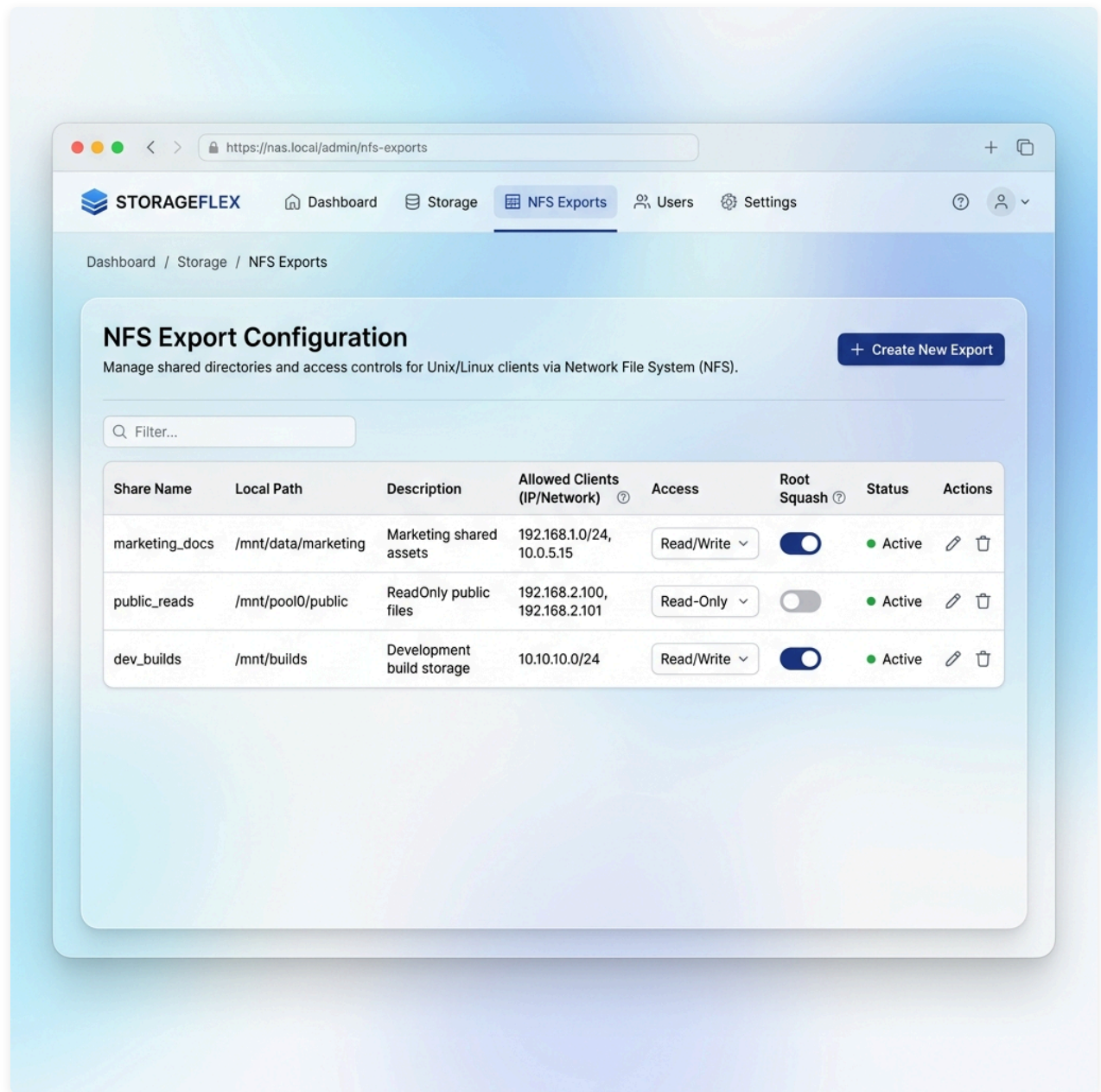
75%

Cancel



iSCSI Targets & NFS Exports

- **iSCSI LUN Mapping:** Expose raw virtual hard drives securely using IQN access control lists. This is the primary driver for Windows Diskless Booting.
- **NFS Share Config:** Manage Linux RootFS streaming by tuning `root_squash` and `read-only` toggles.



4. Educational Dashboard & Bulk Provisioning

Designed specifically for IT administrators in school districts or massive call centers.

- **Classrooms / Groups:** Logically group endpoints by physical location (e.g., Lab 101).
- **Visual Map:** View color-coded seating charts to instantly spot offline or un-booted endpoints.
- **Mass Payload Deployment:** Use the dropdown to assign a specific Master Image to an entire room, then issue a bulk Wake-on-LAN command to image 50 machines concurrently without touching a single keyboard.

Dashboard

Classrooms / Groups

Device Inventory

Images & Templates

Job Scheduling

System Settings

Help & Support

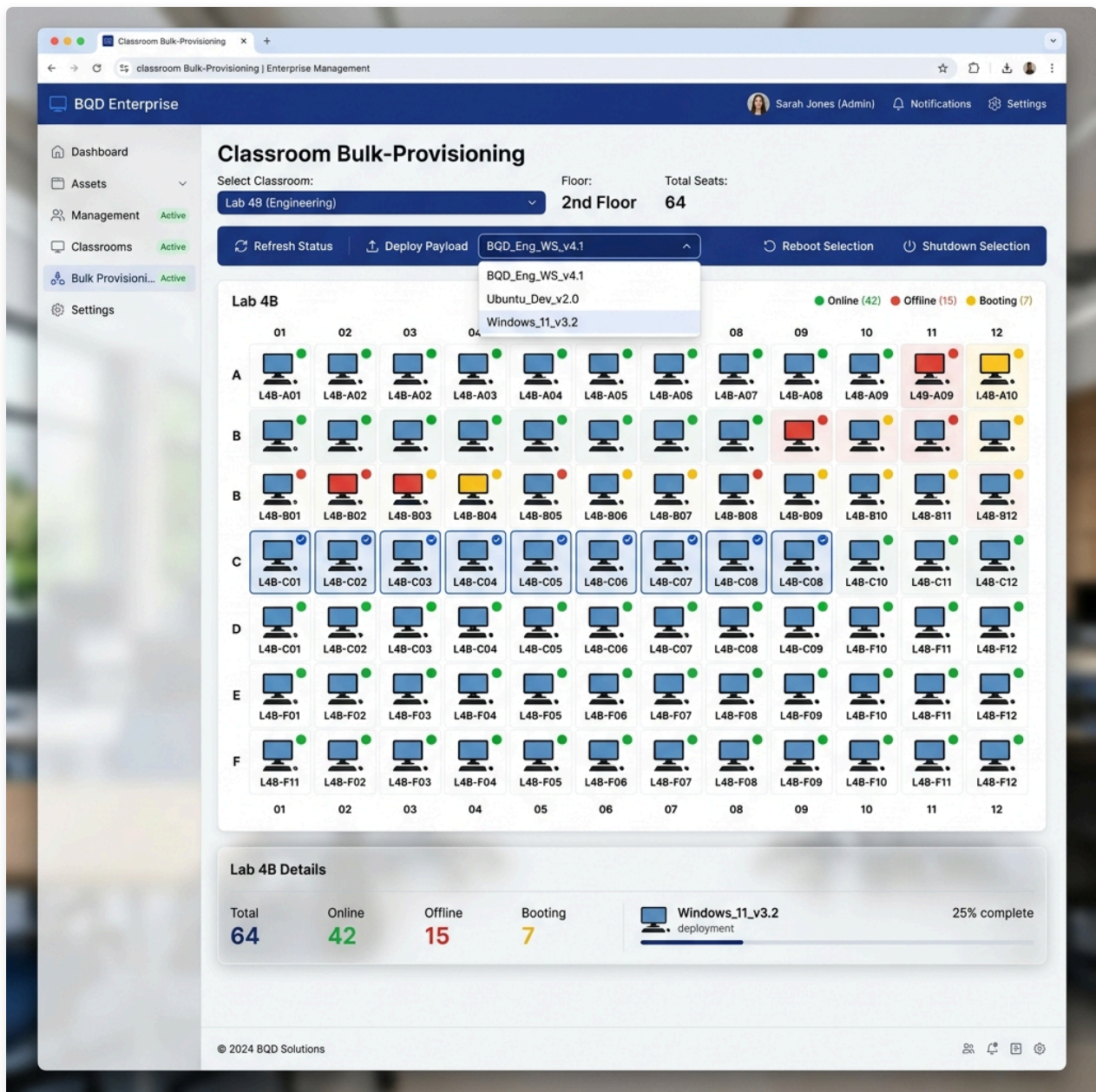
Classrooms / Groups

+ Add Action

18 new items

Search

Classroom Name	Location	Number of Devices	Status	Actions
Lab 101	School Lab	18	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>
Library	Library 31	13	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>
STEM Lab	STEM Lab	12	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>
Art Studio	Barwill Center	13	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>
Art Studio	Barwill Center	29	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>
School Computer Lab 1	School Lab	18	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>
School Computer Lab 2	School Lab	13	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>
School Computer Lab 3	School Lab	17	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>
School Computer Lab 4	School Lab	22	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>
Rm 203	School Lab	11	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>
Rm 201	School Lab	9	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>
Rm 202	School Lab	19	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>
Rm 203	School Lab	30	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>
Rm 204	School Lab	13	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>
Rm 205	School Lab	21	Complete	<button>Wake-on-LAN (Subnet Broadcast)</button> <button>Re-provision</button>



5. Security & Enterprise Identity

The v4.1.0 update brought Zero-Trust architecture to SPS.

Active Directory / LDAP Authentication

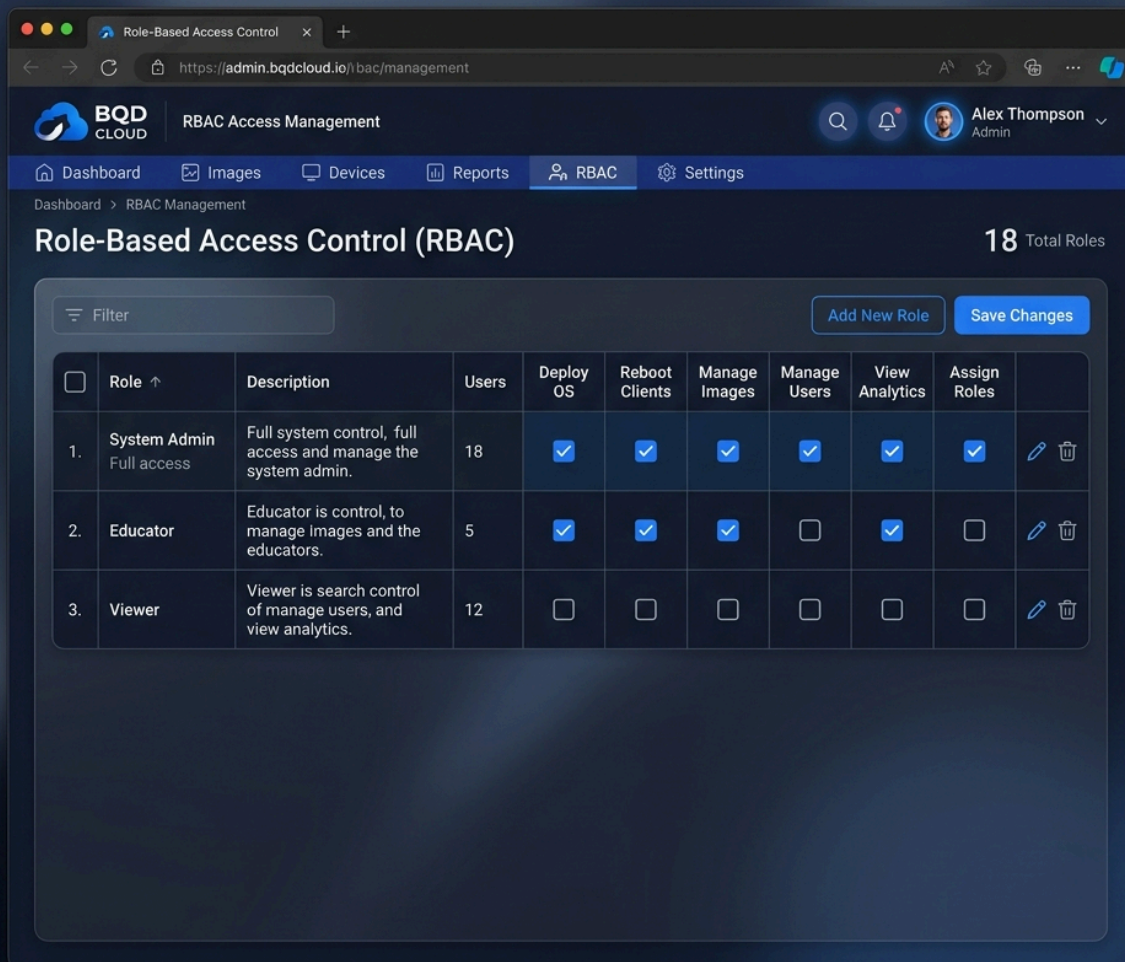
- **Bind Identity:** Connect SPS to your Windows Domain Controller or OpenLDAP instance.

- **Test Connection:** Ensure credentials and Base DN queries are properly authenticated.

The screenshot shows the 'Administrator' interface with a sidebar menu on the left containing: Dashboard, ADMINS, Commomd, Users, Security, Dashboards, Authentication (highlighted), Dymimication, Configure, Unism Users, and Settings. The main content area is titled 'Enterprise Authentication (LDAP/AD)' with the subtitle 'Configure connection settings for your Active Directory or LDAP server.' A modal window titled 'Enterprise Authentication (LDAP/AD)' is open, showing the following fields: LDAP Server URI (ldap://ldap.example.com), Base DN (dc=example,dc=com), Bind DN (cn=admin,dc=example,dc=com), and a password field (masked with dots). Below these fields is a 'Test Connection' button and a green status bar indicating 'Connection Successful'. The background configuration page includes fields for User Search Filter (cn=admin,dc=example,dc=com), Group Search Filter (dc=example,dc=com), and Attribute Mapping (Att=innlty), with 'Save Changes' and 'Cancel' buttons at the bottom.

Role-Based Access Control (RBAC)

- Granularly define what imported AD users can do.
- Prevent a generic "Educator" from accidentally formatting or deleting Master VHDs while allowing them to issue "Reboot Client" and "Deploy OS" commands.



Zero-Trust API & Licensing

- **API Keys:** Issue bearer tokens for CI/CD integrations instead of relying on insecure User-Agent checks.
- **Strict MAC Validation:** Prevent unauthorized laptops from pulling sensitive corporate Windows images by locking payloads to explicitly authorized MAC addresses.
- **License Management:** Cryptographically secure offline token validation with built-in Anti-Rollback mechanisms to detect system clock manipulation.

Zero-Trust Security & API Keys

https://app.bqdsecurity.com/settings/api-keys

BQD Security Platform

Dashboard

Security Rules

API Keys

Audit Logs

Settings

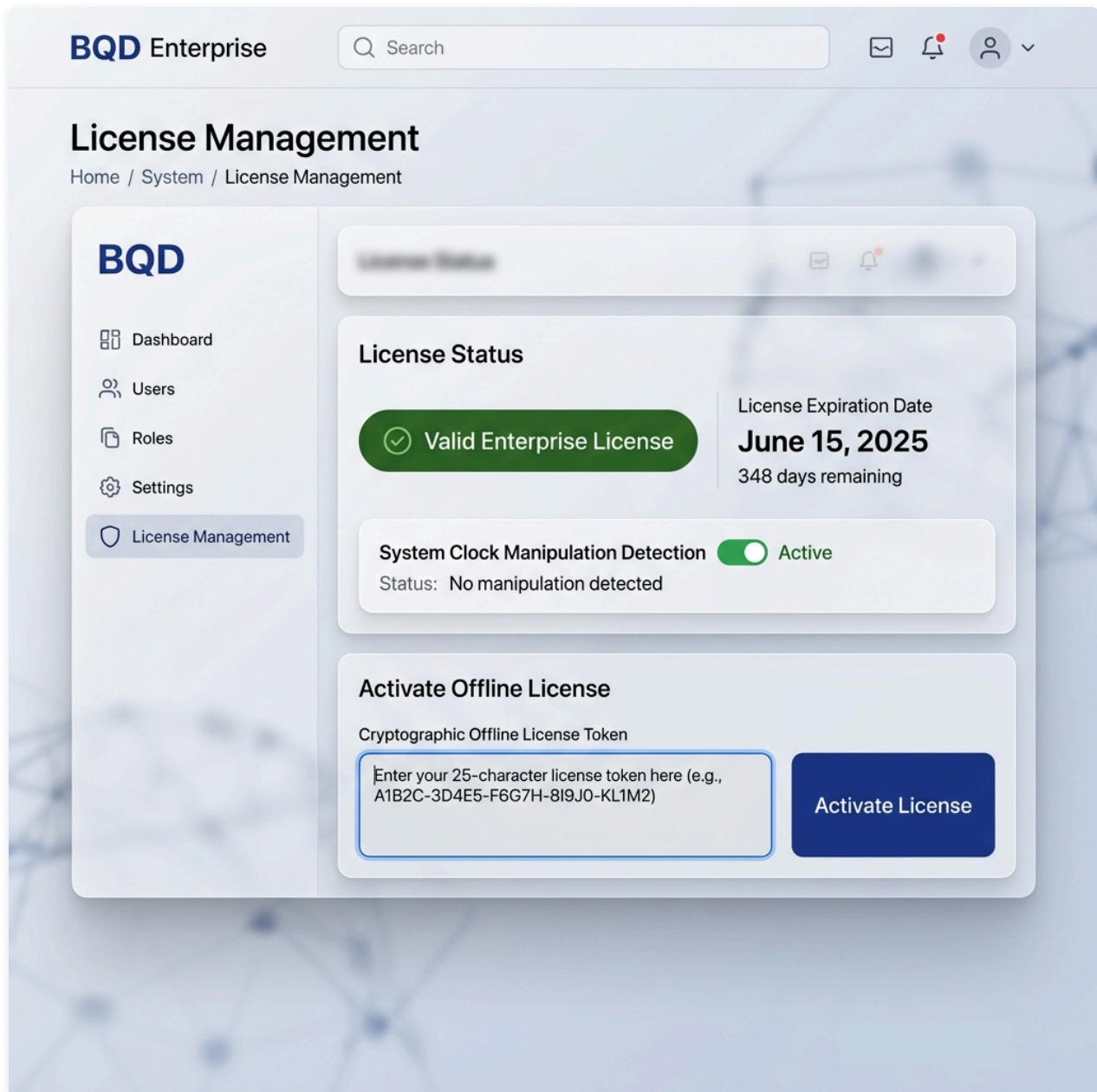
API Keys Management

Search...

Create New API Key

Active API Keys

Key Name	Key Preview	Created At	Scopes	Status	Enforce Strict MAC Validation	Actions
API Key 1	bqd_live_.....	July 12-15 5:30 PM	Read/Write	Active	☒	Edit Delete
Key Key 2	bqd_live_.....	July 12-15 5:30 PM	Read/Write	Active	☒	Edit Delete
Key Key 3	bqd_live_.....	July 12-15 5:30 PM	Read-Only	Active	☐	Edit Delete
Key Key 4	bqd_live_.....	July 12-15 5:30 PM	Read-Only	Active	☒	Edit Delete
Key Key 5	bqd_live_.....	July 12-15 5:30 PM	Read-Only	Active	☒	Edit Delete
Key Key 6	bqd_live_.....	July 12-15 5:30 PM	Read/Write	Active	☒	Edit Delete
Key Key 7	bqd_live_.....	July 12-15 5:30 PM	Read-Only	Active	☐	Edit Delete
Key Key 8	bqd_live_.....	July 12-15 5:30 PM	Read-Only	Active	☐	Edit Delete
Key Key 9	bqd_live_.....	July 12-15 5:30 PM	Read-Only	Active	☒	Edit Delete
Key Key 10	bqd_live_.....	July 12-15 5:30 PM	Read-Only	Active	☒	Edit Delete
Key Key 11	bqd_live_.....	July 12-15 5:30 PM	Read-Only	Active	☐	Edit Delete
Key Key 12	bqd_live_.....	July 12-15 5:30 PM	Read-Only	Active	☐	Edit Delete
Key Key 13	bqd_live_.....	July 12-15 5:30 PM	Read-Only	Active	☐	Edit Delete
Key Key 14	bqd_live_.....	July 12-15 5:30 PM	Read-Only	Active	☒	Edit Delete



Note on Licensing Model: Features discussed in this manual (such as LDAP, Zero-Trust API, Diskless Overlays, VLAN Subnet Wake-on-LAN, and Classroom Provisioning) require an active Enterprise Tier License. Unlicensed installations operate gracefully in Community Mode with standard deployment features enabled, including full access to Basic Networking, DHCP configuration, and Secure Boot EFI selection.