

HyperSDK

Complete Platform Summary

The unified VM management platform: 31 dashboard views, 170+ API endpoints, 10 cloud providers, and 45 React components — all in a single open-source Go binary.

Apache 2.0 — Go 1.24 — Hexagonal Architecture — Production Ready

Platform at a Glance

Everything you need to manage, migrate, monitor, and optimize VM infrastructure.

31

Dashboard views

170+

API endpoints

10

Cloud providers

45

React components



Migration

Upload, export, convert, and deploy VMs across 10 providers. Bulk operations, format conversion, and disk discovery.



Observability

Health scoring, process monitoring, container status, smart alerts, explain mode, and live debug tools.



Infrastructure

VM creation wizard, snapshot management, storage pool operations, and ISO management.



Security

PAM authentication, RBAC, audit logging, secret management, and security scanning.



Cost Optimization

Multi-cloud cost comparison, on-prem savings calculator, carbon-



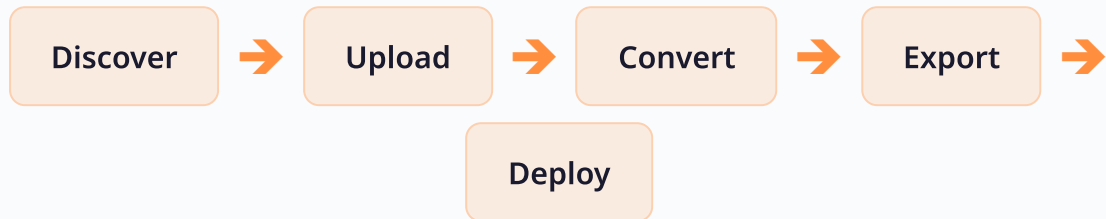
Developer Tools

REST API, CLI tool, manifest builder, WebSocket events, and comprehensive documentation.

aware scheduling, and TCO
projection.

Migration Capabilities

Complete VM migration lifecycle from discovery to deployment.



Upload

- Drag & drop from browser
- 50 GB file support
- Format validation
- Progress tracking
- Chunked multipart

Export

- OVF, OVA, VMDK, qcow2
- CBT incremental
- Parallel download
- 10 provider sources
- Bulk export

Convert

- qcow2, vmdk, vhd, vhdx, raw
- qemu-img backend
- Progress tracking
- Integrity verification
- Batch conversion

Deploy

- virt-install integration
- Auto-config CPU/memory
- Network auto-detection
- Storage pool placement
- OS variant optimization

Discover

- Multi-path disk scanning
- Format detection by header
- VM association mapping
- Orphaned image flagging

Bulk Ops

- Multi-VM export
- Bulk shutdown
- Bulk snapshot
- Parallel processing
- Per-VM audit trail

- Network topology mapping

Observability

8 specialized views for system health, debugging, and automated root-cause analysis.



Health Score (0-100)

Composite gauge with CPU, memory, IO, and network subsystem breakdown. Bottleneck detection identifies the constraint.



Smart Alerts

Multi-condition rules with duration-based triggers. Severity levels route to webhooks, email, or Slack. Noise-free alerting.



Explain Mode

"Why is CPU high?" — automated analysis listing contributing processes, factors, and actionable recommendations.



Debug Tools

Live top, iostat, vmstat, and netstat in the browser. Process table, container status, kernel state, and security overview.

8

Observability views

<

100ms

Update latency

0

SSH sessions needed

Infrastructure

Snapshots, storage pools, ISOs, and VM creation — all managed from the browser.



Snapshot Manager

Create, revert, and delete VM snapshots via virsh. Pre-migration safety snapshots ensure rollback capability.



Storage Pool Manager

Libvirt pool listing with capacity bars. Browse volumes. Create, activate, and refresh pools. Capacity warnings.



ISO Manager

ISO library with virtio-win detection. Hot-attach to running VMs. Content inspection and checksum validation.



VM Create Wizard

5-step guided wizard: name, CPU/memory, storage, network, review. Generates and executes virt-install commands.



Backup Scheduler

Visual cron builder for automated exports. Daily, weekly, or custom. Retention policies with automatic cleanup.



Incremental Backups

CBT-based incremental exports: 95% faster, 90% less storage. Synthetic full backups prevent chain degradation.

Security & Compliance

Enterprise security built into every layer of the platform.



PAM Authentication

Linux PAM integration for user authentication. Use existing system accounts. JWT tokens for API session management.



RBAC

Role-based access control with admin, operator, and viewer roles. Fine-grained permissions per API endpoint.



Audit Logging

Every API call logged with user, timestamp, action, and result. Immutable audit trail for compliance and forensics.



Secret Management

Provider credentials encrypted at rest. Secure key rotation. No plaintext secrets in configuration files.

Security Feature	Implementation	Status
Authentication	PAM + JWT	Active
Authorization	RBAC (3 roles)	Active
Encryption (transit)	TLS 1.3	Active
Encryption (rest)	AES-256	Active
Audit logging	Structured JSON	Active
Rate limiting	Per-IP + per-user	Active

Developer Experience

REST API, CLI, SDKs, and CI/CD integration for automation-first workflows.



REST API (170+ endpoints)

Comprehensive REST API with JSON request/response. Versioned at /api/v1/. OpenAPI-compatible endpoint documentation.



CLI Tool (hyperctl)

Full-featured CLI for scripting and automation. Export, convert, deploy, and manage VMs from the command line.



Go SDK

Native Go module (hypersdk) with type-safe client, domain types, and provider interfaces. Import and extend.



CI/CD Integration

Readiness checks as pipeline gates. Automated migration on merge. Webhook notifications to CI systems.

Architecture

Hexagonal

Domain types in internal/domain, port interfaces in internal/ports, adapters in daemon/ and providers/.

12 Domain Types

Job, Schedule, Capability, vSphere, Cost, Carbon, Webhook, Audit, Backup, RBAC, Secrets, Provider.

13+ Port Interfaces

JobStore, JobManager, ScheduleManager, AuthManager, AuditLogger, SecretManager,

ComputeProvider,
and more.

Getting Started

From zero to running in 3 commands.

1

Install

```
make install
```

2

Start the Daemon

```
sudo systemctl start hypervisord
```

3

Open the Dashboard

```
https://localhost:8443
```

Three Access Points

Interface	URL / Command	Use Case
Dashboard	https://localhost:8443	Visual management, monitoring, and operations
REST API	https://localhost:8443/api/v1/	Automation, CI/CD, and scripting
CLI	hyperctl	Command-line operations and shell scripts

Next Steps

Run Readiness Check

Verify all 17 dependencies are installed. The readiness view highlights what needs attention.

Connect a Provider

Add your first cloud provider (vSphere, AWS, Azure, etc.) from the Provider Manager view.

Export Your First VM

Set Up Backups

Browse VMs, select one, choose the export format, and watch the progress bar move.

Create a backup schedule with the visual cron builder. Choose VMs, format, and retention policy.

HyperSDK — Your Complete VM Platform

31 views. 170+ endpoints. 10 providers. Open source. Start managing your VM infrastructure the modern way.

HyperSDK — Complete Platform Summary