HyperSDK

VMware vSphere Migration Deep Dive

Complete walkthrough of HyperSDK's vSphere integration — from VM discovery and export to full migration to KVM, with govmomi-powered automation and enterprise-grade reliability.

govmomi SDK — OVF/OVA/VMDK Export — Resumable Downloads

vSphere Integration Overview

How HyperSDK connects to VMware vCenter and ESXi hosts via the govmomi SDK.

govmomi SDK

HyperSDK uses the official VMware govmomi Go library for native vSphere API access. Full SOAP-based communication with vCenter Server and standalone ESXi hosts — no CLI wrappers or SSH scripts.

Direct API Access

REST and SOAP endpoints for VM lifecycle, property collection, snapshot management, and disk operations. Supports vSphere 6.5 through 8.0+ with automatic API version negotiation.

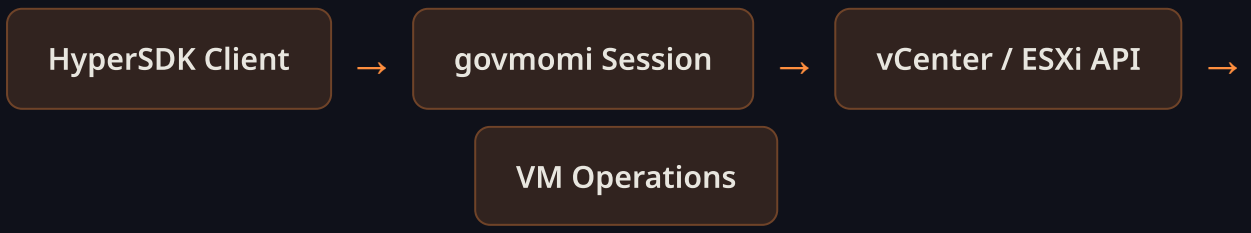
Connection Pooling

Persistent, reusable vSphere sessions with automatic keep-alive, token refresh, and graceful reconnection. Connection pool prevents session exhaustion under concurrent workloads.

Authentication

Username/password, SSO token, and certificate-based auth. TLS certificate validation with optional thumbprint pinning for self-signed certificates in lab environments.

Architecture



HyperSDK's vSphere provider handles 100% of communication via govmomi — zero dependency on govc, ovftool, or PowerCLI.

VM Discovery

Find, filter, and enumerate virtual machines across your entire vSphere infrastructure.

List All VMs

Enumerate every VM across all datacenters, clusters, and resource pools. Returns unified VMInfo structs with name, UUID, power state, CPU, memory, disk, and network details.

Search & Filter

Search by VM name, UUID, IP address, or custom attributes. Filter by power state (poweredOn, poweredOff, suspended), guest OS family, or resource pool path.

Datacenter / Cluster Scope

Scope discovery to specific datacenters, clusters, or folders. Hierarchical traversal follows the vSphere inventory tree for efficient property collection.

Rich Metadata

Each discovered VM includes guest OS, VMware Tools status, hardware version, snapshot tree, disk provisioning type, and network adapter configuration.

Discovery Pipeline

Filter	Example	Description
Power State	poweredOn	Only running VMs ready for live export
Datacenter	DC-West	Scope to a specific datacenter
Cluster	Prod-Cluster-01	VMs in a specific compute cluster
Guest OS	rhel8_64Guest	Filter by guest operating system ID
Name Pattern	web-server-*	Wildcard match on VM display name

Export Methods

Multiple export formats with parallel downloads, resume support, and real-time progress tracking.

OVF Export

Full VM export as OVF descriptor + VMDK disks. Preserves hardware config, network mappings, and custom properties. Ideal for re-import into other hypervisors.

OVA Export

Single-file OVA archive containing OVF + disks. Portable, easy to transfer, and universally supported. Streamed directly — no temp files required.

VMDK Download

Raw VMDK disk download via HTTP/HTTPS. Supports both monolithic flat and sparse formats. Fastest option for disk-only migrations.

Download Features

Parallel Downloads

Multi-disk VMs download all disks concurrently. Configurable parallelism level to balance throughput against network saturation.

Resumable Transfers

HTTP Range header support for resume after interruption. Checksum validation ensures data integrity on resumed downloads.

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Progress Tracking

Real-time progress callbacks with bytes transferred, percentage complete, estimated time remaining, and current throughput (MB/s).

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Integrity Verification

SHA-256 checksums computed during download and verified against vSphere-reported values. Automatic retry on mismatch.

Advanced Features

Enterprise capabilities for complex migration scenarios.

CBT Incremental Export

Changed Block Tracking (CBT) enables incremental disk exports. Only modified blocks since the last snapshot are transferred — reducing export time by 80-95% for subsequent runs.

Snapshot Handling

Automatic snapshot creation before export for crash-consistent state. Snapshot cleanup after successful export. Support for quiesced snapshots with VMware Tools.

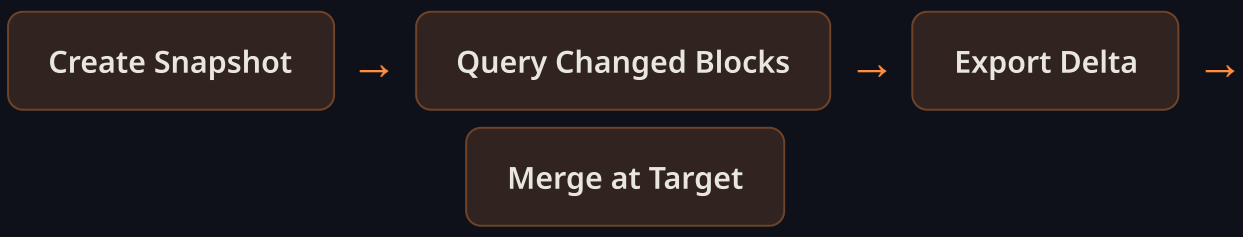
CD-ROM Removal

Automatic detection and removal of CD-ROM/ISO mounts that would block export. Re-attaches media after export completes if the VM remains on the source.

Graceful VM Shutdown

Guest-initiated shutdown via VMware Tools for clean export. Configurable timeout with fallback to hard power-off. Ensures filesystem consistency.

CBT Incremental Flow



95%

4x

0

Less Data Transferred (CBT)

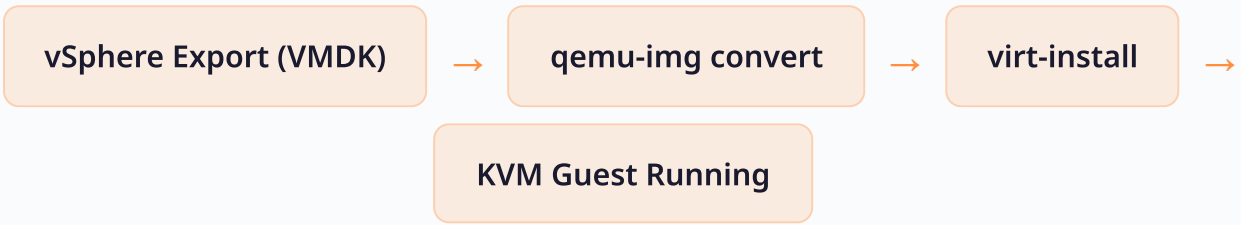
Faster Incremental Exports

Downtime with Live CBT

Migration to KVM

End-to-end path from vSphere VMs to production KVM/libvirt or the hyper2kvm automated pipeline.

Manual Migration Path



Step 1: Export from vSphere

Use HyperSDK to export VM as VMDK or OVF. The SDK handles authentication, snapshot creation, disk download with progress, and cleanup automatically.

Step 2: Convert Disk Format

Convert VMDK to QCOW2 using qemu-img or HyperSDK's native Go converter (zero external dependency). Supports thin provisioning and compression.

Step 3: Create KVM Guest

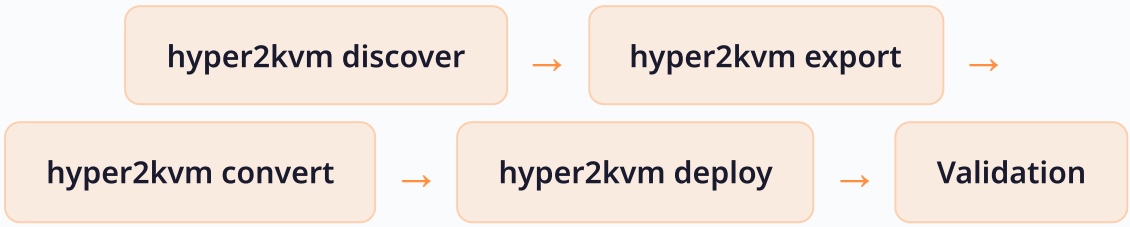
Use virt-install or libvirt XML to define the VM with VirtIO drivers for disk and network. Map CPU/memory from the original vSphere VM configuration.

Step 4: Post-Migration

Install VirtIO drivers (Windows guests), remove VMware Tools, update network config, and validate boot. HyperSDK generates a migration report for audit.

hyper2kvm Automated Pipeline

> *The hyper2kvm tool wraps the entire migration into a single command: discover, export, convert, and deploy — with a web dashboard for monitoring progress across hundreds of VMs.*



Ready to Migrate from vSphere?

HyperSDK handles the complexity of VMware APIs so you can focus on planning and validation. Start with a single VM pilot, then scale to hundreds with batch migration.