POLYSTACK TECHNOLOGIES

IronCore™

Powered by VM2CLOUD

Enterprise-grade OpenStack distribution — packaged, hardened, deployed and supported by vm2cloud, sold by Polystack. The freedom of upstream open source with the predictability of a commercial software contract.

Performance You Can See. Architecture You Can Trust.

1. What You Buy

IronCore™ powered by vm2cloud is Polystack's commercial subscription to open-source OpenStack — engineered and supported by vm2cloud.

You receive a hardened, integration-tested release of upstream OpenStack — complete with deployment services, certified Polystack engineering, 24×7 break-fix support, security patches and bug-fix backports — under an annual subscription per managed node.

- **Hardened distribution.** Integration-tested release of Nova, Neutron, Cinder, Glance, Keystone, Horizon, Heat, Octavia, Designate, Barbican and the telemetry stack — pinned versions, signed packages, CVE-tracked.
- **Deployment services.** Polystack engineers' size, install and validate the cluster on-site or remotely. Production sign-off in 4–6 weeks for a standard 3-rack reference design.
- **24×7 enterprise support.** Technical account Engineer, 15-minute response on Severity-1 incidents, single channel for OpenStack, Ceph, OVN, KVM and Polystack Hardware issues.

- **Bug-fix backporting.** Polystack engineering ships hotfix builds for confirmed bugs and contributes the fix upstream — your patched build, the community gets the same code.
- **Security patches.** Monthly CVE roll-ups for every component in the stack, plus emergency out-of-band releases for critical vulnerabilities.
  Lifecycle management. Validated in-place upgrades, LTS releases supported for 36 months, migration tooling between releases included.

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2. Why Open-Source OpenStack

- **No per-core or per-socket royalties.** Subscription priced per managed node — scale RAM, CPU and VM density without renegotiating contracts.
- **Vendor-neutral by design.** Standard OpenStack APIs and OVF/QCOW2 image formats — workloads remain portable to any conformant cloud.
- **Community-validated at hyperscale.** Powers production clouds at CERN, Walmart, Workday, Bloomberg and major telcos worldwide — billions of compute-hours of operational experience by tech partner Vm2Cloud.
- **Auditable supply chain.** All source code under Apache-2.0; SBOM, CVE feed and reproducible builds published with every release.
- **Sovereignty-ready.** Deploy fully on-premises or in-region — no metadata, telemetry or control plane leaves the cluster. Air-gap deployment supported.
- **Off-ramp from proprietary lock-in.** A documented exit from VMware vSphere, Nutanix AHV and Hyper-V licensing without giving up enterprise support.

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3. Core Capabilities (Upstream OpenStack Components)

Compute (Nova)	KVM/QEMU hypervisor, live migration, evacuation, host aggregates, server groups, anti-affinity, CPU pinning, NUMA topology, huge-pages, PCI passthrough, vGPU, instance resize, snapshots and metadata service.
Block Storage (Cinder)	Persistent volumes, snapshots, clones, multi-attach, volume types, QoS, encryption at rest, backup/restore, retype and Ceph RBD as default backend.
Object Storage (Swift / Ceph RGW)	S3- and Swift-compatible object store, erasure coding, lifecycle policies, bucket versioning, multi-region replication.
Networking (Neutron + OVN)	Software-defined networking via OVN, distributed virtual routers, security groups, VLAN/VXLAN/Geneve tenant isolation, floating IPs, BGP dynamic routing, QoS bandwidth shaping, FWaaS and trunk ports.
Load Balancing (Octavia)	Layer-4 and Layer-7 load balancing, TLS termination, HTTP/HTTPS health monitors, session persistence, Amphora and OVN-provider drivers.
Identity (Keystone)	Domain/project/role hierarchy, federated identity (SAML 2.0, OIDC), LDAP/AD integration, application credentials and full RBAC across every service.
Image Service (Glance)	QCOW2, RAW, VMDK, VHD, ISO support; image signing, properties, snapshot lifecycle, multi-store back-ends.
Orchestration (Heat)	HOT templates for Infrastructure-as-Code, auto-scaling groups, stack updates and rollback, integration with software configuration tools.
DNS-as-a-Service (Designate)	Self-service DNS zones, record sets, PowerDNS / BIND back-ends, secondary zone replication.
Secrets (Barbican)	HSM-backed key storage, volume encryption keys, TLS certificate lifecycle.
Telemetry (Ceilometer / Gnocchi / Aodh)	Metering events, time-series metrics, alarm thresholds and webhook actions.
Dashboard (Horizon)	Self-service web UI for projects, instances, volumes, networks, images, users, roles and quotas.
Bare-Metal (Ironic, optional)	Provision bare-metal nodes through the same Nova API used for virtual machines.
Shared Filesystems (Manila, optional)	NFS / CIFS shared-FS as a service over CephFS or NetApp back-ends.

4. Virtualization Layer

- **Hypervisor:** KVM (Kernel-based Virtual Machine) with QEMU device model — the same hypervisor trusted by every major public cloud.
- **Guest OS support:** All Linux distributions (RHEL, Rocky, Alma, SUSE, Ubuntu, Debian, Amazon Linux, Oracle Linux), Windows Server 2012R2 through 2025, Windows 10 / 11.
- **Firmware:** Legacy BIOS (SeaBIOS) and UEFI (OVMF) with optional Secure Boot.
- **Virtual hardware:** Up to 240 vCPUs, 6 TiB RAM, 16 NICs and 26 disks per instance (configurable).

- **Live operations:** Live migration (block-mirror and shared-storage), live resize of CPU and memory where guest tools permit, online volume attach/detach and online snapshot.
- **Hardware acceleration:** SR-IOV for line-rate networking, DPDK fast-path, vGPU via NVIDIA vGPU manager, PCI passthrough for FPGAs, smart-NICs and accelerator cards.
- **vTPM 2.0:** Per-instance virtual Trusted Platform Module via swtpm — supports BitLocker, LUKS+TPM2 and Windows 11 attestation.

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5. Software-Defined Storage

- **Backend:** Ceph distributed storage — RBD for block, RGW for object, CephFS for shared file.
- **Resilience:** Configurable replication (3× default) or erasure-coded pools (k+m) with per-host, per-rack or per-room failure domains.
- **Scale:** Linear scale-out from 3 nodes to thousands; petabyte-class clusters in production.
- **Tiering:** Mix NVMe, SSD and HDD device classes; assign workloads to tiers via Cinder volume types.
- **Data services:** Snapshots, clones, thin provisioning, compression, encryption at rest (LUKS) and in flight (msgr2).
- **Self-healing:** Automatic re-replication on disk or host failure with no operator intervention.

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6. Networking — Neutron + OVN

- **Tenant isolation:** VLAN, VXLAN and Geneve overlays; per-project virtual routers and security groups.
- **Distributed routing:** OVN distributes L3 routing across compute hosts — east-west traffic never traverses a controller.
- **Floating IPs / NAT:** 1:1 floating-IP DNAT for external reachability, SNAT for default egress.
- **BGP dynamic routing:** Advertise project networks upstream to physical fabric routers.
- **Service chaining:** Port mirroring, QoS, FWaaS, VPNaaS, trunk ports for nested-VLAN workloads.
- **IPv6:** Dual-stack support with SLAAC and DHCPv6 modes.

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7. Security & Compliance

- **Identity:** Keystone with SAML / OIDC federation, LDAP and Active Directory integration.
- **RBAC:** Domain Project Role hierarchy across every service, enforced by oslo policy.
- **Encryption:** At-rest LUKS volumes, in-flight TLS on every API and message-bus channel, Barbican-backed key management with HSM support.
- **Audit:** CADF-formatted audit events to syslog, SIEM or object storage.
- **Compliance scaffolding:** Hardening profiles aligned with CIS Benchmarks, NIST SP 800-53, ISO 27001, Essential Eight (Australia) and IRAP.
- **Network policy:** Stateful security groups, default-deny tenancy, optional micro-segmentation via OVN ACLs.

8. Deployment Services Included

Every IronCore subscription includes a structured deployment programme delivered by certified OpenStack engineers under Polystack's contract. Standard engagements complete in 4–6 weeks; complex multi-region deployments are scoped separately.

- **Phase 1 — Design.** Polystack architects scope workload sizing, hardware bill-of-materials, network fabric review, security and compliance posture, high-level architecture document and a signed-off deployment plan.
- **Phase 2 — Build.** Polystack engineers perform on-site or remote installation of the control plane, compute nodes, Ceph storage cluster, OVN data-plane, monitoring stack and migration toolchain.
- **Phase 3 — Validate.** Acceptance test suite covering live migration, snapshot/restore, multi-AZ failover, BGP convergence, load-balancer stickiness, backup integrity and performance benchmarks against the SLA targets in the contract.
- **Phase 4 — Operationalise.** Operator runbooks, on-call handover to the Polystack support desk, monitoring dashboards, customer-side knowledge transfer (3 days) and the first production workload migration.
- **Optional add-ons.** VMware exit programme (Polystack -led), CI/CD pipeline integration, Kubernetes-on-OpenStack (Magnum or external), DR site build-out.

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9. Support Tiers & Service-Level Agreements

	Standard	Enterprise	Mission-Critical
Coverage hours	Business hours (10×5)	24×7	24×7
Severity-1 response	4 hours	1 hour	15 minutes
Severity-2 response	8 hours	4 hours	1 hour
Severity-3 response	1 business day	8 hours	4 hours
Named TAM	Pooled	Yes	Yes (dedicated)
Quarterly health review	—	Yes	Yes (monthly)
Annual on-site engineering	—	1 visit	4 visits
Security patch SLA	Monthly	Monthly + emergency	Monthly + emergency
Bug-fix backport priority	Best-effort	Targeted	Hot-patch within 72 h
Architecture review	Annual	Bi-annual	Quarterly

All tiers include unlimited tickets, access to the Polystack Knowledge Base, validated upgrade paths and direct escalation to Polystack engineering. Severity definitions and full contractual response/restore commitments are set out in the Polystack Master Support Agreement, which incorporates the Polystack technical support charter by reference.

10. Bug-Fix Policy & Upstream Contribution

- **Single point of accountability.** Polystack engineering owns triage and resolution across every layer — Nova, Neutron, Cinder, Ceph, OVN, KVM, libvirt and Servers (in case of Polystack hardware)— so customers never get bounced between vendors. Polystack remains the commercial contract holder.
- **Hot-patch builds.** Confirmed Severity-1 and Severity-2 defects are fixed in a customer-specific hot-patch build of the affected component, signed by Polystack and shipped within the tier's SLA window.
- **Upstream-first commitment.** Every fix is also submitted to the upstream OpenStack project by Polystack engineers, so the global community benefits — and so the customer's deployment converges with mainline at the next release, never on a forked branch.
- **Long-Term Support releases.** Polystack designates one OpenStack release every 24 months as Long-Term Support, with 36 months of security-patch and bug-fix coverage.
- **Validated upgrade tooling.** Each LTS-to-LTS upgrade ships with an automated runbook, schema-migration validation, rollback plan and a Polystack-led upgrade engagement.

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11. Target Use Cases

- **VMware exit / consolidation.** Replace ESXi, vCenter, vSAN and NSX with a single open-source stack — Polystack migrates the workloads and runs them under enterprise support, sold by Polystack.
- **Sovereign cloud.** On-premises or in-country deployment with full data-residency control.
- **AI / ML workloads.** vGPU and PCI passthrough for training and inference clusters.
- **Service-provider clouds.** Multi-tenant public or partner cloud with metered, billing-ready telemetry.

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- **Government & defence.** Air-gapped or classified-network deployments with a vendor-neutral, auditable software supply chain.
- **Edge & regional sites.** Lightweight 3-node footprints with central control-plane federation

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12. Reference Specifications (Minimum Deployment)

Control plane	3 nodes — 16 vCPU, 64 GB RAM, 2× 480 GB SSD each (HA)
Compute nodes	From 3 nodes — sized to workload; CPU virtualisation extensions required
Storage nodes	From 3 nodes — at least 4 OSD drives per node (NVMe, SSD or HDD)
Network fabric	Dual 10/25/100 GbE leaf-spine; MTU 9000 recommended for VXLAN/Geneve
Operating system	Ubuntu 22.04 / 24.04 LTS, Rocky Linux 9, RHEL 9 (host OS)
Hypervisor	KVM 6.0+ / QEMU 6.0+
OpenStack release	Current upstream LTS (Caracal, Dalmatian and newer)
Tested cluster size	3 to 500+ nodes; reference deployments at multi-thousand-node scale

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13. Why IronCore Powered by vm2cloud

- **100 % open-source software.** No proprietary modules, no dual-licensing, no per-core fees.
- **Commercial accountability.** Subscription contract with Polystack with named owners, written SLAs and bug-fix commitments.
- **Production-proven OpenStack.** Battle-tested at hyperscale operators since 2010.
- **Single integrated fabric.** Compute, storage, networking, identity, secrets and migration delivered as one.
- **Migration without lock-in.** Polystack lands workloads on standard OpenStack — they remain portable to any conformant cloud.

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- **Sovereign by default.** Air-gap-friendly; no phone-home telemetry; full source available.
- **Engineered by Polystack**. 24×7 enterprise support, bug-fix backports, upstream contributions and a dedicated technical account manager.
- **Sold by Polystack.** Local contracting entity, Made-in-India server hardware available as an optional turnkey bundle, and end-to-end accountability under a single Master Support Agreement.

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