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REFERENCE ARCHITECTURE

Two-site private cloud on 2026 servers: hyperconverged or VCF 9, decided by VMware: Stay or Leave

CAPABILITY	DOCUMENT	VERSION	DATE
Data Center	SRA-DC-001	1.4	Oct 10, 2026

WRITTEN BY

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Document control

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CONVENTIONS

Source tags. [S] read Sep 7, 2026 from the vendor's own document: Nutanix NVD-2031 On-Premises Hybrid Cloud with AHV Design v2.0, April 2026, 103 pp · Nutanix Platform Architecture for Datacenters v1.1 (design objectives) · Dell PowerEdge R7725 spec sheet · HPE ProLiant Compute DL380 Gen12 datasheet · Broadcom VMware Cloud Foundation 9.1 design guide (concepts and architectural options) · [A] typical-buyer assumption · **[VMware: Stay or Leave]** the row the published virtualization comparison decides. **[S, Sep 24, 2026]** the 2026 technology review: each source and its URL are listed in §9.2. **[S, Sep 27, 2026]** the ESX-path replication sources, URLs in §9.2. [S*] figure from a published summary or secondary page where the vendor page itself was not read. A row with more than one tag is counted once: as a published figure if any tag is [S] or [S*], otherwise as an assumption if any tag is [A], otherwise as a design target.

Table 1. Revision history

Date	Version	Change
Sep 15, 2026	1.0	First issue.
Sep 21, 2026	1.1	Corrections to wording, figure numbering and citations.
Sep 27, 2026	1.2	Revised to current platform versions and the current document format.
Oct 7, 2026	1.3	One rule removed from the §9.3 table of industry rules.
Oct 10, 2026	1.4	Approval line now reads: approved by the Founder, issued by Symbeeo. Steve Phillips remains the author.

1 · Scope

Who it is for. The head of infrastructure replacing end-of-support virtualization hosts across two sites, who must choose a platform after the 2023–24 VMware licensing change and prove to the board that the choice was compared, not inherited.

Typical buyer [A]. 250 virtual machines at issue (2026-09), 400 by 2029; two sites 40 km apart; RPO of minutes, RTO of hours; Active Directory; a regulator who asks for the DR test record.

What is in. Two pods, one per site; compute nodes; distributed or vSAN storage; a management plane per pod; replication and DR between sites; self-service VM provisioning in three sizes; the ordering list. **What is out.** Applications; the WAN and DCI (SRA-NET-001); public-cloud extension; GPU nodes (SRA-AI-001).

Related documents. NVD-2031 [S] · VCF 9.1 design guide [S] · Dell R7725 [S] · HPE DL380 Gen12 [S] · Newcastle-under-Lyme Borough Council cabinet paper, Feb 6, 2024, as a public buyer's own statement of the problem (two data centers, 250 servers, five-year refresh); a public document, not a Symbeeo client.

2 · Requirements register

Table 2. Requirements register

#	Requirement	Value	Source
R1	Sites	2 pods, 40 km apart (NVD-2031 designs for ≥ 300 km regions; 40 km is metro DR)	[A]; [S] Nutanix portal reference architecture

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#	Requirement	Value	Source
R2	Uptime, production	99.99 % per pod; NVD-2031's two-AZ figure is 99.999 %	[A]; [S]
R3	RPO	0 min in pod (synchronous storage); 15 min to the other pod with NearSync (AHV path) or vSphere Replication, VR (ESX path; RPO set per VM from 5 min to 24 h; in VCF 9.1 part of Protection and Recovery, formerly VMware Live Recovery); 2 h and 24 h tiers	[S] NVD-2031, Nutanix portal reference architecture; [S, Sep 27, 2026] vSphere Replication (§9.2)
R4	RTO	2 h in pod; 4 h option; recovery plans tested twice a year	[S] NVD-2031
R5	Minimum nodes per cluster	4	[S] Nutanix portal reference architecture
R6	Cluster types	management · application · storage-heavy (AI/ML cluster is SRA-AI-001)	[S] Nutanix portal reference architecture
R7	Hypervisor and platform	AHV on Nutanix Cloud Platform, or ESX on VCF 9.1.1; decided per client by the published comparison VMware: Stay or Leave (Broadcom renamed ESXi to ESX from VCF 9.0)	**[VMware: Stay or Leave]**; [S*, Sep 24, 2026]
R8	Server, AMD path	Dell PowerEdge R7725: 2U, 2 × AMD EPYC 9005, up to 6 TB DDR5, up to 8 × PCIe Gen5 + dual OCP, E3.S NVMe	[S]
R9	Server, Intel path	HPE ProLiant DL380 Gen12: Intel Xeon 6, up to 144 cores, up to 8 TB DDR5-6400, iLO 7	[S]
R10	Management plane	dual Prism Central per pod (AHV) or VCF 9 management domain (ESX); AD-integrated; AD-group RBAC	[S] NVD-2031; VCF 9.1
R11	Standard VM sizes	3 (small, medium, large), self-service	[S] NVD-2031
R12	Security	least-privilege AD groups; CA-signed certificates; hypervisor, control-plane and data-plane hardening; checksum verification; policy-deviation alerts; separate traffic classes; encryption at rest (platform encryption with a key manager) and in transit (management and replication); security logs sent over TLS to the buyer's collector (VCF 9.1 blocks unencrypted syslog on port 514)	[S] portal; [S, Sep 24, 2026] VCF 9.1 support notes; [A] mechanism on the AHV path confirmed at workshop
R13	Monitoring	alerts to a continuously staffed mailbox; email resilient during outage	[S] NVD-2031
R14	Software baseline	AOS 7.5+, AHV 11.0+, Prism Central pc.7.5+ (AHV path; current release AOS 7.6 · AHV 11.2 · pc.7.6, Jul 27, 2026); VCF 9.1.1+ (ESX path; GA Sep 3, 2026). AOS 7.0 and pc.2024.3 are not used: both left maintenance Mar 31, 2026 (§9.2)	[S, Sep 24, 2026]; [S*] AHV pairing

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3 · Architecture overview

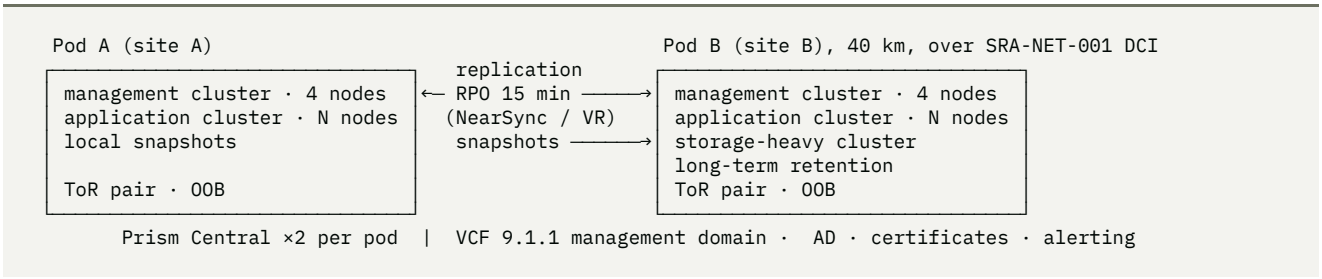


Figure 1. Two-site private cloud, pod A and pod B

4 · Component design

4.1 Physical.

Per pod: 1–2 racks, A/B feeds, ToR pair; R5 node minimum per cluster. Rack power from the server spec sheets at configured load [S].

4.2 Network.

Leaf-spine or ToR pair per pod; 2 × 25/100GbE per node; separate traffic classes for management, storage/replication and workload (R12). Inter-pod replication rides the DCI in SRA-NET-001.

4.3 Compute nodes.

One model per cluster type (R6). AMD path: R7725 [S]. Intel path: DL380 Gen12 [S]. Sizing: three VM sizes × expected count × N+1 (R11).

4.4 Storage.

AHV path: Nutanix distributed storage; storage-heavy nodes for the storage cluster; snapshots as the third copy [S]. ESX path: vSAN ESA in VCF 9.1 [S].

4.5 Hypervisor and management.

R7 by VMware: Stay or Leave. AHV path: dual Prism Central per pod, NCM self-service [S] NVD-2031. ESX path: VCF 9.1 management domain, fleet management, workload domains [S]. Both: AD, AD-group RBAC (R10).

4.6 Backup and DR.

Cross-pod replication at R3; recovery plans tested to R4; long-term retention at pod B [S] NVD-2031 §5.

4.7 Security.

R12, item by item, with the owning team named in the as-built. Encryption at rest and in transit, and security logs over TLS to the buyer's collector, are proven in STP-DC-001 T18–T20.

4.8 Monitoring.

R13.

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4.9 Lifecycle.

Platform LCM; baseline R14; EoL per part number in §9. No item is quoted past its vendor's end-of-sale date, and every item's end-of-support date is on the quote (SDD-DC-001 §9). Software is kept on a release still in maintenance: AOS/Prism Central releases leave maintenance about 15 months after release (derived from the dates in §9.2), so the quarterly LCM in §8 checks the maintenance date, not only the support date.

5 · Options and platform choices

Decision table, one row per decision; the option rows follow, grouped under their decision.

Table 3. Options and platform choices

ID	Decision	Requirement	Alternatives considered	Decision taken	Rationale
D1	Hypervisor and platform	R7, R10, R14	(a) hyperconverged on AHV, NVD-2031 shape · (b) VCF 9.1 on vSAN ESA · (c) Red Hat OpenShift Virtualization Engine · (d) Microsoft Azure Local	**[VMware: Stay or Leave]**	Both (a) and (b) meet §2. (a) a validated design with a test plan exists [S]; cost band node-priced. (b) the incumbent shape; the VCF 9.1 design guide exists [S]; cost band subscription. (c) and (d) are current alternatives recorded for the comparison; this design is written for (a) and (b) [A]
D2	Server CPU path	R8, R9	(a) AMD, Dell R7725 · (b) Intel, HPE DL380 Gen12 · (c) Dell R7825 on AMD EPYC "Venice"	(a) or (b) per client; (c) rejected for 2026	Core density (144 per socket, Intel) against memory (6 TB AMD, 8 TB Intel) [S]; cost band comparable. (c) is announced by Dell for 2027 and cannot be quoted now [S*, Sep 24, 2026]; reconsider at the next refresh
D3	Site topology	R1–R4	(a) two pods with cross-pod replication · (b) single pod + backup	(a)	(b) fails R1–R4: no second site for recovery; lower cost band
D4	Storage architecture	R3, R5, R6	(a) hyperconverged storage, distributed or vSAN ESA (follows D1) · (b) three-tier SAN	(a)	(b) meets §2 but is array-priced and has more parts than (a)

Option rows by decision:

Table 4. Options and platform choices

Decision	Option	Meets §2	Cost band	Chosen	Why
D1	Hyperconverged on AHV (NVD-2031 shape)	Y	node-priced	**[VMware: Stay or Leave]**	Validated design with a test plan exists [S]
D1	VCF 9.1 on vSAN	Y	subscription	**[VMware: Stay or Leave]**	The incumbent shape; VCF 9 design guide exists [S]
D2	AMD R7725 vs Intel DL380 Gen12	both	comparable	per client	Core density (144 Intel) vs memory (6 TB AMD, 8 TB Intel) [S]
D3	Single pod + backup	fails R1–R4	lower	N	Fails R1–R4: no second site for recovery

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Decision	Option	Meets §2	Cost band	Chosen	Why
D4	Three-tier SAN	Y	array-priced	N	More parts than the two above

6 · Failure conditions

Table 5. Failure conditions

#	Condition	What the user sees	Recovers by itself	Needs a hand	Time
F1	One node down	none	VM restart; storage rebuild	replace node	minutes; rebuild hours [S]
F2	One disk down	none	distributed rebuild	replace	hours
F3	ToR down	none	second ToR	replace	0
F4	Management cluster down	workloads run; no changes	none	restore	R4
F5	Replication link down	none; RPO grows	resumes	investigate DCI	until repaired
F6	Pod A lost	workloads down until failover	no	run recovery plan at pod B	RTO 2 h (R4)

7 · Validation

None yet. NVD-2031 §8 is a test plan for this shape; run verbatim on the first build, its results are recorded here.

8 · Operations and lessons learned

Quarterly LCM; DR drill twice a year against R4; uptime measured monthly against R2; capacity review at 70 %. Lessons: to be written by the signing engineer.

9 · Appendix

9.1 Ordering list, per pod [S]/[A]:

4 × management nodes · N × application nodes · N × storage-heavy nodes · 2 × ToR · 1 × OOB switch · licenses per R7 and R14 · support terms. **References:** NVD-2031 · Nutanix portal RA · VCF 9.1 design guide · R7725 spec sheet · DL380 Gen12 datasheet.

9.2 · 2026 technology review, read Sep 24, 2026.

Every product, version and standard in this set was checked against a live source. Replaced where superseded; kept where current.

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Table 6. 2026 technology review, read Sep 24, 2026

Item reviewed	Finding	Result	Source (read Sep 24, 2026)
AOS 7.0+	AOS 7.0 released Dec 4, 2024; end of maintenance Mar 31, 2026, end of support Dec 31, 2026. AOS 7.3 leaves maintenance Sep 30, 2026. AOS 7.5 (Dec 8, 2025) maintained to Mar 31, 2027; AOS 7.6 released Jul 27, 2026	**AOS 7.5+**, target 7.6	`https://endoflife.date/nutanix-aos` (aggregates the Nutanix EOL page, which needs a portal login) · `https://next.nutanix.com/product-updates/aos-7-6-45767`
Prism Central pc.2024.3+	pc.2024.3 end of maintenance Mar 31, 2026, end of support Dec 31, 2026; versioning changed to pc.7.x; pc.7.6 released Jul 27, 2026	**pc.7.5+**, target pc.7.6	`https://endoflife.date/nutanix-prism`
AHV 10+	AOS 7.5 pairs with AHV 11.0; AOS 7.6 with AHV 11.2	**AHV 11.0+**, target 11.2	[S*] `https://en.vmik.net/2025/12/ntnx-aos75-ahv11-pc75-release/` · `https://en.vmik.net/2026/07/ntnx-aos76-ahv112-pc76-release/`
VCF 9.1	VCF 9.1 GA May 12, 2026; 9.1.1 GA Sep 3, 2026	**VCF 9.1.1+**	`https://techdocs.broadcom.com/us/en/vmware-cis/vcf/vcf-9-0-and-later/9-1/release-notes/vmware-cloud-foundation-9-1-0-0-release-notes.html` · `https://blogs.vmware.com/cloud-foundation/2026/09/03/announcing-general-availability-of-vmware-cloud-foundation-9-1-1/`
"ESXi"	Broadcom names the hypervisor ESX from VCF 9.0	**ESX**	[S*] `https://techdocs.broadcom.com/us/en/vmware-cis/vcf/vcf-9-0-and-later/9-0/release-notes/patch-releases-9-0-0-x/esx/esx-9-0-0-0100.html`
Syslog to a collector	VCF 9.1: unencrypted syslog on port 514 is blocked; SHA-1 use deprecated	security logs over TLS in R12; tested in STP T20	`https://techdocs.broadcom.com/us/en/vmware-cis/vcf/vcf-9-0-and-later/9-1/release-notes/vmware-cloud-foundation-9-1-0-0-release-notes/vcf-91-product-support-notes.html`
Dell PowerEdge R7725	Current product; its EPYC "Venice" successor R7825 is announced for 2027	**kept**	`https://www.delltechnologies.com/asset/en-us/products/servers/technical-support/poweredge-r7725-technical-guide.pdf` · `https://www.servethehome.com/dell-showcases-upcoming-epyc-venice-poweredge-systems-adds-new-5-8pb-powerstore-elite/`
HPE ProLiant DL380 Gen12	Current product; Xeon 6, up to 144 cores per socket, 8 TB DDR5-6400, iLO 7	**kept**	`https://www.hpe.com/us/en/products/compute/proliant/dl380-gen12.html`
VCF 9.1 design guide	Current	**kept**	`https://techdocs.broadcom.com/us/en/vmware-cis/vcf/vcf-9-0-and-later/9-1/design.html`
NIST SP 800-88 Rev. 2 (SDD §9)	Published Sep 26, 2025; Rev. 1 withdrawn the same day	**kept**	`https://www.nist.gov/news-events/news/2025/09/guidelines-media-sanitization-nist-publishes-sp-800-88r2`
NCM Self-Service, NearSync, vSAN ESA	Current names and features	**kept**	`https://next.nutanix.com/product-updates/prism-central-pc-7-6-45766` · VCF 9.1 release notes above

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Item reviewed	Finding	Result	Source (read Sep 24, 2026)
NVD-2031 v2.0, April 2026	The public portal page is still keyed "NVD-2031-Hybrid-Cloud-6-5"; the full document needs a portal login. v2.0 not verified on Sep 24, 2026	kept, **unverified**	https://portal.nutanix.com/page/documents/solutions/details?targetId=NVD-2031-Hybrid-Cloud-6-5-On-Premises-Design%3ANVD-2031-Hybrid-Cloud-6-5-On-Premises-Design
Cross-pod replication on the ESX path	VCF 9.1 (May 12, 2026): VMware Live Recovery renamed Protection and Recovery, covering Live Site Recovery, vSphere Replication and vSAN Data Protection; upgrading vSphere Replication to 9.1 requires every replication to be reconfigured to enhanced replication; a management server manages up to 5,000 replicated VMs	**vSphere Replication, enhanced replication, 15-min RPO**, in R3 and SDD-DC-001 §4.4; tested in STP-DC-001 T11	read Sep 27, 2026: https://techdocs.broadcom.com/us/en/vmware-cis/vcf/protection-and-recovery/9-1/release-notes/protection-and-recovery-91-release-notes.html
vSphere Replication RPO and limits	RPO 5 min to 24 h per VM; 1 min to 24 h with enhanced replication and an Advanced Cyber Compliance or Site Recovery Manager subscription; up to 24 point-in-time instances per VM; 5-minute RPO for 500 VMs; an RPO violation is reported when the latest replica instance is older than the RPO (vSphere Replication 9.0 pages, updated Jul 30, 2026)	R3 range; SDD-DC-001 §4.4 limits	read Sep 27, 2026: https://techdocs.broadcom.com/us/en/vmware-cis/live-recovery/vsphere-replication/9-0/vr-help-plug-in-9-0/replicating-virtual-machines/configure-a-replication.html · https://techdocs.broadcom.com/us/en/vmware-cis/live-recovery/vsphere-replication/9-0/vr-help-plug-in-9-0/vsphere-replication-system-requirements/operational-limits-of-vsphere-replication.html · https://techdocs.broadcom.com/us/en/vmware-cis/live-recovery/vsphere-replication/9-0/vr-help-plug-in-9-0/replicating-virtual-machines/how-the-recovery-point-objective-affects-replication-scheduling.html
VMware Live Recovery subscription	a subscription for every protected VM, and for re-protected VMs at the recovery site; vSphere Replication RPO selectable from 1 minute to 24 hours (FAQ, January 2026)	SDD-DC-001 §4.4 licensing note; the unit (per protected VM or per core) confirmed at quote, as VMware: Stay or Leave R-3 records [A]	read Sep 27, 2026: https://www.vmware.com/docs/vmware-live-recovery-faq (the PDF address used on Sep 27, 2026 now redirects here)

9.3 · Industry rules this architecture helps a buyer meet.

Only rules linked to this document's requirements are listed; rules this document does not address are left out.

Table 7. Industry rules this architecture helps a buyer meet

Rule	Jurisdiction	What it asks of infrastructure	Requirements here	Coverage
FFIEC IT Examination Handbook, Business Continuity Management booklet (Nov 2019)	US · banks and credit unions	recovery objectives set, alternate processing arranged, recovery tested	R4 (tested by STP-DC-001 T13)	full
HIPAA Security Rule, 45 CFR Part 164 Subpart C (the January 2025 proposed update is not final)	US · covered entities and business associates	contingency plan (backup, disaster recovery); encryption of ePHI at rest and in transit	R3, R4, R12	partial
NERC CIP-009-6 (enforceable; CIP-009-7.1 from Jul 1, 2028)	US and Canada · Bulk Electric System entities	recovery plans for BES Cyber Systems, tested at least every 15 months	R4	full

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Rule	Jurisdiction	What it asks of infrastructure	Requirements here	Coverage
21 CFR 211.68 (automatic, mechanical and electronic equipment)	US · FDA drug manufacturing (cGMP)	backup data exact, complete and secure from alteration or loss; master records changed by authorized people only	R3, R4	full

Naming a rule here is not a claim of compliance or certification: the buyer's assessor decides compliance, and Symbeeo holds no certification or authorization.

Sources for §9.3, read Sep 25, 2026: FFIEC BCM booklet [S] `https://www.occ.treas.gov/news-issuances/bulletins/2019/bulletin-2019-57.html` (read on the OCC bulletin; ithandbook.ffiec.gov could not be opened, so "still current" is inferred) · HIPAA Security Rule; status of the proposed update, final action targeted July 2027 [S] `https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202510&RIN=0945-AA22` · NERC CIP-009-6 [S] `https://www.nerc.com/standards/reliability-standards/cip/cip-009-6` · 21 CFR 211.68 [S] `https://www.ecfr.gov/current/title-21/chapter-I/subchapter-C/part-211/subpart-D/section-211.68`.

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Figures are as published by their sources on the dates given in this document; figures marked [A] are assumptions.

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