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DESIGN STUDY

Hyperconverged edge for 30 manufacturing plants, managed from one console

Complete design on current platforms

CAPABILITY	INDUSTRY	SETTING
Data Center	Manufacturing	Industrial group
DOCUMENT	**VERSION**	**DATE**
DC-003	1.3	Oct 10, 2026

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Document control

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Sign-off	"An engagement under this design is signed by the practice lead before any build proceeds."		

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CONVENTIONS

Source tags. [S] figure read from the vendor's own current page on Sep 18, 2026 · [S*] figure from the vendor's page summary where the page itself could not be opened · [A] design assumption, to be confirmed by the signing engineer · [T] design target: the record's outcome figure and anything derived from it. No figure comes from any engagement, file or asset. 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 18, 2026	1.0	First issue.
Sep 20, 2026	1.1	Public implementations added; figures reconciled with published sources.
Sep 27, 2026	1.2	Figures and platform details rechecked against published sources.
Oct 10, 2026	1.3	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 of an industrial group whose plants each run a different-aged pair of servers under a local contractor, who wants one platform, one console and one upgrade calendar, and who cannot let a WAN cut stop a production line.

Typical buyer [A]. An industrial group with 30 plants in six countries. Per plant: 25–40 VMs for MES, historian, print, file and badge services; 120 vCPU and 600 GB RAM peak; 20 TB of usable storage. Plant WAN: one carrier circuit plus one broadband circuit, 50–200 Mbit/s. Group data center hosts the ERP and identity; each plant has a single 42U rack with UPS.

What is in. Thirty three-node clusters, the central management plane, the plant-local survival rules for a WAN cut, and the per-site first-power-on tracking. **What is out.** The plant OT network and its firewalls; the group data center; application changes; the WAN contracts.

Assumptions. Nutanix is the HCI software vendor and HPE the server vendor [A]. Each plant rack has two 25 GbE top-of-rack switches already, out of scope [A]. Plants are visited by a regional engineer, not group staff [A]. Identity at the plant survives a WAN cut through a local read-only domain controller VM [A].

Related documents, read Sep 18, 2026.

- HPE ProLiant Compute DL380 Gen12 QuickSpecs — https://www.hpe.com/us/en/collaterals/collateral.a00073551enw.html
- Nutanix, introducing HPE ProLiant Compute Gen12 for Nutanix — https://www.nutanix.com/blog/introducing-hpe-proliant-compute-gen12-for-nutanix
- HPE ProLiant Compute Gen12 for Nutanix (resource page) — https://www.hpe.com/us/en/resource-library.video.hpe-proliant-compute-gen12-for-nutanix.v100008613.html
- Nutanix on HPE ProLiant (portfolio page) — https://www.nutanix.com/hpe
- Nutanix Prism 7.3, witness for two-node clusters (page could not be opened) — https://portal.nutanix.com/page/documents/details?targetId=Web-Console-Guide-Prism-v7_3%3Awc-cluster-two-node-witness-wc-r.html

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- Nutanix, introducing X-Small Prism Central (read Sep 20, 2026) — https://www.nutanix.com/tech-center/blog/introducing-x-small-prism-central-a-low-footprint-option-for-smaller-environments
- Nutanix, remote and branch office solution brief (read Sep 20, 2026) — https://www.nutanix.com/library/solution-briefs/bring-data-center-class-infrastructure-and-centralized-management-to-remote-sites
- Nutanix, Brazilian vehicle manufacturer customer story (read Sep 20, 2026) — https://www.nutanix.com/es_mx/company/customers/mercedes-benz

1c · Public implementations this design follows

Deployment rows are real public deployments, each dated. Where no public deployment matches, the row is Vendor documentation: the vendor's document that this design, Symbeeo's own, is built on.

Table 2. Public implementations this design follows

Implementation	Who published it · date	What it settles for this design	URL
Vendor documentation. Prism Central size tiers: X-Small is capped at 5 clusters, 50 hosts, 500 VMs, 5 concurrent users; Small, Large and X-Large sit above it	Nutanix tech center · May 31, 2024	R6: 30 clusters and 90 nodes need a Prism Central above X-Small	https://www.nutanix.com/tech-center/blog/introducing-x-small-prism-central-a-low-footprint-option-for-smaller-environments
Vendor documentation. Remote-site pattern: "a Nutanix cluster of 1, 2, or 3 or more nodes" per site, every location managed from one console	Nutanix solution brief · May 16, 2022, modified Oct 21, 2024	R2 and R6: three-node clusters per plant under one console is the vendor's own remote-site pattern	https://www.nutanix.com/library/solution-briefs/bring-data-center-class-infrastructure-and-centralized-management-to-remote-sites
Deployment. A vehicle manufacturer's four Brazilian plants on four AHV clusters, nine nodes, two data centers; cluster upgrades from six hours to thirty minutes	Nutanix customer story · Nov 26, 2020, modified Oct 5, 2022 (page metadata, read Sep 27, 2026); the project began in the first half of 2018	R7 and §4.4: multi-plant AHV clusters upgraded from one place, at a smaller scale than R1	https://www.nutanix.com/es_mx/company/customers/mercedes-benz

2 · Requirements register

Table 3. Requirements register

#	Requirement	Value	Source
R1	Sites	30 plants · 6 countries · 1 rack each	[A]
R2	Cluster size	3 nodes per plant, 90 nodes in total	[T]
R3	Per-plant load	25–40 VMs · 120 vCPU · 600 GB RAM · 20 TB usable	[A]
R4	Node	2U, Intel Xeon 6, up to 86 P-cores per socket, 32 DIMM slots to 8 TB	[S] DL380 Gen12

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#	Requirement	Value	Source
R5	Node validation	HPE ProLiant Compute Gen12 for Nutanix, 1-, 2- and 4-socket designs, DL configuration replacing DX	[S] Nutanix announcement
R6	Management	one Nutanix Prism Central for all 30 clusters, sized above X-Small (X-Small limit: 5 clusters · 50 hosts · 500 VMs)	[S] "Nutanix Prism console's single-pane management"; [S] X-Small limits https://www.nutanix.com/tech-center/blog/introducing-x-small-prism-central-a-low-footprint-option-for-smaller-environments; [T] one plane
R7	Lifecycle	one-click software and firmware upgrade per cluster	[S] Nutanix Life Cycle Manager, "same unified, one-click experience for both software and firmware"
R8	Server management	HPE iLO 7 on every node	[S] DL380 Gen12 iLO 7 ASIC; [S] Nutanix announcement
R9	WAN-cut survival	plant VMs keep running with no reachability to the group data center	[T]
R10	Node failure	one node down, all plant VMs still running	[T]; [A] N+1 sizing
R11	Witness	none; three nodes hold quorum locally	[A] three-node cluster, no external witness
R12	First power-on	date, engineer, pass/fail and rework recorded per site	[T]
R13	Rollout pace	2 plants per week, 15 weeks	[A]

Thirteen rows; five carry a vendor figure, five are design assumptions, three are design targets.

3 · Architecture overview

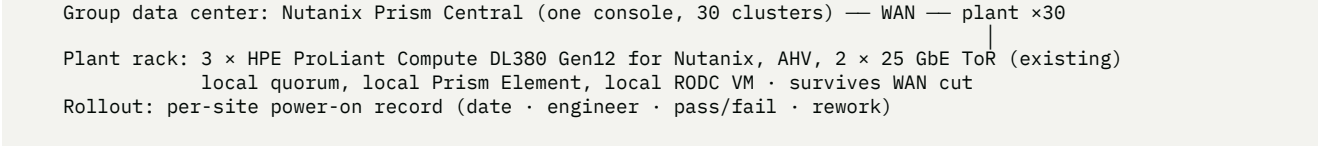


Figure 1. Plant clusters under one console

Ninety identical nodes in thirty identical clusters. The central console holds policy, upgrades and reporting; each plant holds its own quorum, its own data and its own hypervisor so that the group WAN is a convenience, not a dependency.

Table 4. Architecture overview

Role	Product (exact model)	Qty	Capacity used	Why this unit
Node	HPE ProLiant Compute DL380 Gen12 (Gen12 for Nutanix configuration)	90	120 vCPU of 3 × 32 cores at 2:1; 600 GB of 3 × 512 GB RAM [A]	2U, Xeon 6, 32 DIMMs, iLO 7 [S]; validated for Nutanix [S]
Hypervisor	Nutanix AHV	30 clusters	25–40 VMs each [A]	included with the Nutanix stack [A]

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Role	Product (exact model)	Qty	Capacity used	Why this unit
Cluster management	Nutanix Prism Element	30	one per cluster	local console when the WAN is down [A]
Central management	Nutanix Prism Central	1	30 clusters, 90 nodes [T]	single-pane management [S]
Lifecycle	Nutanix Life Cycle Manager	1	30 clusters	one-click firmware and software [S]

4 · Design by subsystem

4.1 Node.

DL380 Gen12: 2U, up to two Intel Xeon 6 processors of up to 86 P-cores or 144 E-cores, 32 DIMM slots to 8 TB, up to eight PCIe Gen5 slots, two OCP 3.0 slots, iLO 7 [S]. The Nutanix configuration adds 8-channel DDR5 at 6400 MT/s and U.3 or EDSFF NVMe storage [S]. Specified node: one 32-core Xeon 6, 512 GB RAM, 8 × 7.68 TB NVMe, 2 × 25 GbE [A]. Three nodes give 96 cores and 1.5 TB; a plant's 120 vCPU at 2:1 uses 60 cores and 600 GB, so a single node failure leaves 64 cores and 1 TB [A], which meets R10. Rejected: a 1U node — fewer drive bays; 20 TB usable with replication factor 2 needs about 46 TB raw across three nodes [A].

4.2 Cluster.

Three-node AHV cluster with replication factor 2 [A]. Three nodes hold quorum on their own; the Nutanix witness is documented for two-node clusters [S*] and is not needed here (R11). Rejected: two nodes plus witness — the witness lives across the WAN, which is exactly the link R9 says will be cut.

4.3 Central management.

One Prism Central instance in the group data center registers all 30 clusters [T]; Nutanix describes Prism as single-pane management across the estate [S]. Policy, categories, reporting and upgrade scheduling live centrally; day-to-day VM operations are possible from either console [A]. Rejected: 30 unmanaged Prism Element consoles — fails R6.

4.4 Lifecycle.

Life Cycle Manager runs firmware and software upgrades per cluster with one click [S]; the design schedules two clusters per week in a rolling window so no country has more than one plant upgrading at a time [A]. HPE iLO 7 provides the out-of-band path the regional engineer uses before AHV is up [S].

4.5 WAN-cut behavior.

With the WAN down, the cluster keeps running its VMs on local storage and local quorum; Prism Central marks the cluster unreachable and queues policy changes; the plant engineer uses Prism Element on the local network [A]. A read-only domain controller VM on each cluster keeps badge and file authentication working [A]. Rejected: stretched clusters between plants — plant pairs are hundreds of kilometers apart and would share the same WAN failure (R9).

4.6 First-time power-on tracking.

Per site: a one-page record with the date, the regional engineer, the iLO 7 health check, the Nutanix cluster-create result, pass or fail, and any rework [T]. The record is filled at the rack, not afterwards [A]. Thirty records make the rollout report; the pass rate is counted from them, not typed in.

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5 · Failure behavior

Table 5. Failure behavior

Failure	Behavior	Source
WAN to the group data center cut	plant VMs keep running; Prism Central shows the cluster unreachable; local console used	[T] R9; [A] behavior
One node down	VMs restart on the two remaining nodes; 64 cores and 1 TB remain against a 60-core, 600 GB load	[A] §4.1
One drive down	replication factor 2 rebuilds onto remaining drives	[A]
Two nodes down	cluster loses quorum; plant services stop until a node returns	[A]
Prism Central down	all 30 clusters keep running; central changes wait; local consoles work	[A]
Upgrade fails on one node	LCM halts the cluster's upgrade; other clusters unaffected	[S] per-cluster LCM; [A] halt

6 · Limits

- The per-plant load figures are assumptions; a two-week metrics capture per plant sets the real node size.
- Two nodes down stops the plant; a plant that cannot accept that needs a fourth node, not a witness.
- The rollout pace of two plants a week assumes one regional engineer per country and no customs delay on hardware.
- ToR switches are assumed present and 25 GbE capable; where they are not, the plant needs a switch pair first.
- The X-Small Prism Central tier stops at 5 clusters, 50 hosts and 500 VMs [S] (URL in R6); the limits of the Small tier and above were not read from a vendor page and are to be confirmed before the 30th cluster registers.

7 · Lessons learned

None yet — this is a design study; populated after the first build against it.

8 · The author

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SYMBEEO

Each vendor's tool shows you their option. We show you all of them against one requirement.

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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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