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REFERENCE ARCHITECTURE

Order desk and integration center: one order path across every line carried, racks staged, burned in and signed off before they ship

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CONVENTIONS

Source tags. [S] read on Sep 24, 2026 from the standards body's, regulator's, vendor's or public buyer's own page or document; numbered S1–S21 with URLs in §9.3 · [S*], or a numbered source written **[Sn*]**, figure from a published summary or a secondary page where the owner's page could not be opened on Sep 24, 2026; named as such in §9.3 · [A] design assumption for a typical buyer, to be confirmed by the signing engineer · [CMP] decided by the buyer's published comparison, not by this document. No figure comes from any prior engagement, file or asset. **Disclosure rule.** The staging floor is specified here as a capability: what it does, to what standard, with what record. Its size, location and throughput are not stated in this document; the capacity committed to an engagement is stated on that engagement's quote. 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 10, 2026	`1.3`	Approval line now reads: approved by the Founder, issued by Symbeeo. Avinash Dhinakaran remains the author.

1 · Scope

Who it is for. The head of infrastructure delivery of an organization buying racks, network kit and spares from several manufacturers at once, who wants one place that takes every order, confirms the supplier can actually ship before a date is promised, builds and tests the kit before it leaves, delivers it to each site ready to install, holds the spares, handles every failure the same way whoever made the box, and hands over a record of every serial with its warranty, support and license dates.

Typical buyer [A]. A multi-site enterprise in two countries: one head office, two data centers, 24 branches. Its 12-month refresh is ordered through the desk: 20 data-center racks (12 compute racks of 16 × 2U servers and 2 top-of-rack switches; 8 network racks of 8 × 800G switches), 24 branch kits (a 2-member access switch stack, a firewall HA pair, 8 Wi-Fi 7 access points), and the spares pool for all of it. Lines: Cisco, Dell, HPE, Arista, Fortinet. About 30 purchase orders, 450 order lines and 600 serialized units in the year.

What is in. The order desk (request intake, one quotation format, order placement, allocation confirmation, supplier status); receipt at the dock (serial match to the ship notice, authenticity check, custody); the staging floor (build to a versioned build sheet, firmware baseline, burn-in, quality gates, labeling, pre-shipment sign-off); logistics to site (crating, shipping identity, advance ship notice, delivery window, proof of delivery); the spares pool and one RMA path across all lines; sanitization of returned media; the lifecycle and license record handed over at the end.

What is out. Choosing the product (the capability's own comparison, e.g. SRA-NET-001, SRA-DC-001); sourcing strategy, supplier risk and the certified-engineer register (SRA-RES-001, which hands this desk its source register); installation on site and cutover (SRA-IMP-001, which receives what this capability ships); run-state asset and spend management (SRA-SPD-001, which imports the record this capability hands over); **supplier data exchange on the Catena-X data space and battery passports (covered by the design study INT-002, §9.2)**.

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Assumptions. The client's ERP or procurement suite remains its system of record for purchase orders; the desk works to it [A]. The client names one approver per site for requests and one acceptor for delivered kit [A]. Every line is bought from the manufacturer or a distributor that manufacturer authorizes (SRA-RES-001 R4) [A].

Related documents, read Sep 24, 2026. SDD-INT-001 applies this to the typical buyer; STP-INT-001 tests it. The design studies that apply this architecture: INT-003 (rack staging), INT-004 (procurement desk), INT-005 (lifecycle and license register), INT-006 (spares and RMA hub). Peer practice: integrators' published integration and configuration centers, central rack staging with pre-shipment sign-off, and a systems integrator's data-center supply chain for a cloud provider **[S19]**. Buyer requirements: per-device burn-in QA records (a state university's AI-cluster contract), order accuracy, shipment errors and support by severity on every quote (a county IT-products contract) **[S18]**.

2 · Requirements register

Each row passes the ISO/IEC/IEEE 29148 test **[S1]**: one requirement per row, a value that can be measured, no product named, and a T-case in STP-INT-001 that verifies it (last column). Standards appear only as the measure.

Table 2. Requirements register

#	Requirement	Value	Source	Verified by
R1	Estate ordered through the desk	2 countries · 2 DCs · 24 branches · 20 racks · 24 branch kits · 5 lines · ≈ 30 orders, 450 lines, 600 serialized units a year	[A]	input — not tested
R2	Every request, whatever the line or vendor, enters one queue and receives one order number	100 % of requests	[A]; [S19] peer order desks	T1
R3	Every quotation line states vendor, part number, quantity, unit price and price basis, lead time, end-of-sale date, end-of-support date, and the vendor support level as response time for severity 1–4	100 % of lines	[S18] a county IT-products contract, quote disclosure	T2
R4	Lines quoted or ordered past the manufacturer's published end-of-sale date	0	[S18] a county IT-products contract; [S16] [S17]	T3
R5	A delivery date is committed to the buyer only after the supplier's acknowledgment confirms quantity and ship date for the line	100 % of committed lines	[S14]; [A]	T4
R6	Supplier acknowledgment matches the issued order line for part, quantity and price at first acknowledgment (a variance is handled as a change order, §4.2)	≥ 98 % of lines	[S18] a county IT-products contract, 98 % order accuracy	T5
R7	A supplier's change to an acknowledged ship date reaches the buyer	≤ 1 business day after the change	[A]; SRA-RES-001 R7	T6
R8	Every received serial is matched at the dock to its advance ship notice and order line before it enters staging	100 % of units	[S14] [S15]	T7

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#	Requirement	Value	Source	Verified by
R9	Every serialized unit is checked for authenticity at receipt: by the manufacturer's cryptographic device or platform identity where the product carries one, otherwise by serial lookup against the manufacturer's record (a failed unit is handled as F4)	100 % of units	[S6] [S7] [S8] [S9] [S10] [S11]	T8
R10	Staging is done under an ESD control program to ANSI/ESD S20.20-2021	program in force on every staging day	[S13]	T9
R11	Every rack or kit matches its versioned build sheet and firmware baseline; each deviation carries a signed change order	0 unrecorded deviations	[A]; INT-003 R11	T10
R12	Burn-in under load, per device class, before pre-shipment sign-off	≥ 24 h per server, switch and storage unit; ≥ 5 h per accelerated-compute node, or the manufacturer's procedure where longer	[A]; precedent [S18] a state university's AI-cluster contract	T11
R13	A staging quality record exists per unit: serial, part number, rack and RU position, MAC and management address, firmware at ship, burn-in result, tester, date	100 % of units	[S18] a state university's AI-cluster contract, QA record per device; [A] fields	T12
R14	Every rack, unit, panel port and cable carries an identifier to ANSI/TIA-606-D that matches the record	100 % of identifiers in a sample of every rack	[S3]	T13
R15	No rack or kit leaves the floor without a signed pre-shipment checklist	100 % of shipments	[S19] an integrator's published pre-shipment sign-off	T14
R16	Every logistics unit carries an SSCC on a GS1-128 label and is listed, with the serials inside it, on an advance ship notice the site receives before dispatch	100 % of logistics units	[S15] [S14]	T15
R17	Every transfer of custody (dock, floor, crate, carrier, site) is recorded with time and the person accountable	100 % of transfers	[S5] [S6]	T16
R18	Every crated rack travels with a shock and tilt logger, read on site before power is applied	100 % of crated racks	[A]; INT-003 R14	T17
R19	Deliveries on or before the committed on-site date; each miss logged with cause	≥ 95 % of deliveries	[A]	T18
R20	Shipment errors (wrong item, quantity or site)	< 2 % of shipments	[S18] a county IT-products contract	T19
R21	Spares pool per model, pre-staged at the site's firmware baseline	2 % of installed count per model, minimum 2	[A]; INT-006 R12	T20
R22	Every failure ticket, whatever the line, enters one RMA queue; the pool spare is dispatched	≤ 4 business hours from ticket	[A]; INT-006 R13	T21
R23	Replacement unit on site	next business day from ticket	[A]; INT-006 R3	T22
R24	RMA turnaround recorded per vendor: ticket to replacement on site, and defective to vendor credit	100 % of RMA cases	[A]; INT-006 R4	T23

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#	Requirement	Value	Source	Verified by
R25	Storage media (returned or decommissioned) are sanitized to NIST SP 800-88 Rev. 2, with a certificate per device, before they leave the client's control, or are kept by the client under a non-return service; media holding PHI or other regulated personal data are never taken back unsanitized	100 % of media	[S12]	T24
R26	The handover record carries, per serial: part number, site, the manufacturer's lifecycle dates, warranty start and end, support contract and severity level, license type, term and renewal date	100 % of units	[S17]; INT-005 R6	T25
R27	The handover record imports into the client's asset register keyed on serial	0 unmatched serials	[A]; INT-005	T26

Twenty-seven rows; one is an input (R1), seventeen carry a source anchor (a standard, a vendor's own publication, a public buyer's contract or a peer's published practice), nine are typical-buyer assumptions or carry a design study's design target. Every [A] value is replaced by the client's at the design workshop.

3 · Architecture overview

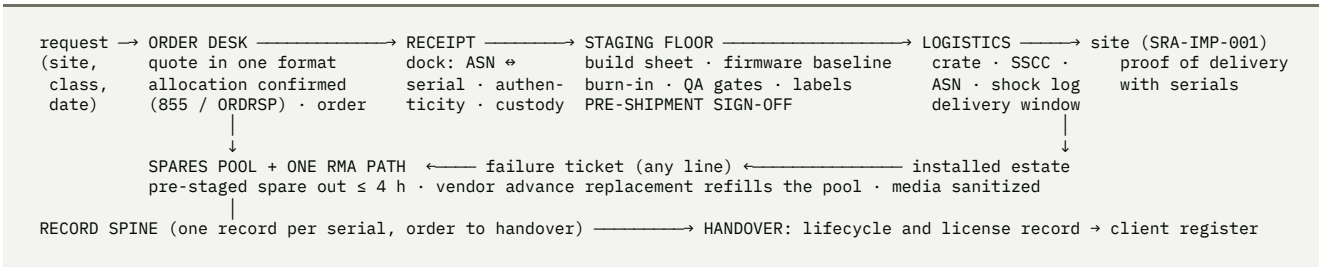


Figure 1. Order-to-handover flow

Six stages and one record spine. Each stage produces one record against the serial; a unit leaves a stage only when its record is complete. The flow is the one INT-003 (staging), -004 (desk), -005 (register) and -006 (spares and RMA) each apply to one part of the capability.

Table 3. Architecture overview

Gate	Check	Record produced
G1 quotation	every line complete (R3), no line past end of sale (R4)	quotation in the one format
G2 allocation	supplier acknowledgment matches the order (R5, R6); date committed only after it	acknowledgment record per line
G3 receipt	serial ⇔ ship notice (R8); authenticity (R9); custody (R17)	receipt record per unit
G4 build	build sheet and firmware baseline matched (R11)	build record per rack or kit
G5 burn-in	duration and result per unit (R12); post-burn-in firmware read	burn-in log; staging quality record (R13)
G6 pre-shipment	labels (R14), quality records complete, checklist signed (R15)	signed pre-shipment checklist

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Gate	Check	Record produced
G7 delivery	SSCC and ship notice (R16), logger read (R18), serials signed for at site	proof of delivery with serials
G8 handover	lifecycle and license record complete (R26) and imported (R27)	handover record

4 · Component design

4.1 Order desk.

One request form, one queue, one order number (R2) [A]. A request is complete when it names the site, the kit class (a rack type or branch-kit type with a fixed bill of materials) and the required-on-site date; an incomplete request is returned, not queued [A] (INT-004 §4.1). The quotation has the same columns whatever the vendor, and each line carries the fields in R3; the support level by severity comes from the vendor contract offered at the quote, never from this document [A].

4.2 Allocation and order exchange.

The desk commits a date only on the supplier's acknowledgment (R5). Where the trading partner supports it, orders and acknowledgments move as X12 850 purchase order, 855 purchase-order acknowledgment, 860/865 change and change acknowledgment, and 856 ship notice **[S14]**, or their EDIFACT/EANCOM counterparts ORDERS, ORDRSP and DESADV **[S15]**; the X12 or EANCOM release is the one agreed with each partner [A]. Otherwise the desk reads the vendor's or distributor's order-status portal and records the confirmation with a screenshot [A]. A variance between acknowledgment and order is a change order signed by the client before the line is accepted [A]. An emailed promise does not commit a date (§5 D2). End-of-sale and end-of-support dates for Cisco lines are read from the Cisco EoX API (v5.0: up to 20 product IDs or serials per request, 50 records a page) **[S17]**, against Cisco's policy of end-of-sale notice typically six months ahead, last ship three months after end of sale and five years of hardware support **[S16]**; other lines from the vendor's own lifecycle page at the quote [A].

4.3 Receipt and authenticity.

Every serial is scanned at the dock against the advance ship notice and the order line (R8); a short or mismatched line is held, not staged [A]. Each unit is then checked for authenticity (R9), the control NIST SP 800-161r1 (update 1, Nov 1, 2024) addresses for counterfeit components **[S6]** and ISO/IEC 20243-1:2023 frames for tainted and counterfeit COTS products **[S7]**: Cisco devices by their Secure Unique Device Identifier, an IEEE 802.1AR certificate bound to product ID and serial in the Trust Anchor module **[S9]**; Dell PowerEdge by Secured Component Verification, a factory-signed platform certificate the recipient validates against the delivered inventory **[S10]**; HPE ProLiant Gen12 by iLO 7 component attestation over SPDM and factory IDevID certificates **[S11*]**; any platform issuing a TCG Platform Certificate (Profile 2.0, revision 39) by that certificate **[S8*]**. A unit without a cryptographic identity is checked by serial lookup against the manufacturer's record [A]. A failed unit is quarantined, photographed, and reported to the supplier, the manufacturer and the client within one business day [A].

4.4 Staging floor.

Racks and kits are built on a floor designed to run under an ESD control program to ANSI/ESD S20.20-2021 (R10) **[S13]**; certification of the floor is not claimed. Each rack type and kit type has a versioned build sheet: an elevation by RU, a cable schedule, power feeds A/B, and the firmware baseline taken from the owning design document (for network kit, SDD-NET-001 §5.4) [A]. Rack layouts respect the cabinet and cabling rules of ANSI/TIA-942-C (May 2024) for the space they go into, including its 800 mm minimum cabinet width in distribution areas **[S2]**. Burn-in power per position is sized

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to the rack's budget at the quote; the floor's size, location and throughput are not stated here (disclosure rule, header) [A].

4.5 Burn-in.

Every unit runs under load before sign-off (R12): servers exercise CPU, memory and storage; switches pass line-rate traffic through loopback optics; power draw, temperature and error counters are logged [A] (INT-003 §4.3). The floor of 24 h per server, switch and storage unit and 5 h per accelerated-compute node is the one a public buyer wrote into a 2025 contract with a QA record per device **[S18]**; neither HPE Factory Express nor Dell Rack Integration Services publishes a burn-in duration **[S21]**, so the duration is a design value, not an industry figure. A unit that fails is swapped from staging stock and the rack re-burned for 24 h [A]. Firmware is read again after burn-in, because a reset can change it; the post-burn-in read is the one that ships [A].

4.6 Quality gates and pre-shipment sign-off.

Gates G1–G8 as tabled in §3. The pre-shipment checklist (R15) covers: build sheet matched, firmware diff empty, burn-in passed for every unit, labels match the record, quality records complete, open change orders closed, photographs of front and rear with power and link lights [A] (the photographs are a per-rack deliverable in a state university's AI-cluster contract **[S18]**). Symbeeo's quality lead signs; the client may witness in person or by video [A]. The process records are kept as documented information in the form ISO 9001:2026 requires of a quality management system **[S4]**; certification of the floor to ISO 9001 or ISO 28000 is **not claimed** in this document (§5 D9).

4.7 Labeling and records.

Identifiers follow ANSI/TIA-606-D (October 2021): an identifier per space, rack, panel, port and cable, with a record per identifier **[S3]**. Each unit also carries an asset tag with a 2D code encoding the serial [A]. The record spine keys everything on the serial: order line → receipt → build position → burn-in → shipment (SSCC) → site → RMA history → handover [A].

4.8 Logistics to site.

Each logistics unit (crate, pallet, carton) carries an 18-digit SSCC on a GS1-128 label **[S15*]**, and the site receives the advance ship notice (X12 856 or DESADV) listing each SSCC and the serials inside before dispatch (R16) **[S14] [S15]**. Racks travel crated with a shock and tilt logger (R18) [A]. Every custody change is recorded (R17), the control ISO 28000:2022 sets for security of goods in an organization's custody **[S5*]**. The delivery window is booked with the site against the required-on-site date; proof of delivery with serials closes the shipment [A].

4.9 Spares pool and one RMA path.

Spares are held per model at 2 % of installed count, minimum 2 (R21), pre-staged at the site's firmware baseline so the site receives a unit ready to swap [A] (INT-006 §4.3). Every failure ticket enters one RMA queue, whatever the badge on the box (R22). The desk raises the vendor RMA under the contract level recorded for that serial and ships the pool spare; the vendor's advance replacement refills the pool, not the site [A]. The vendor cutoffs the queue works to are the vendors' own: Cisco Support (formerly Smart Net Total Care) 8x5xNBD 3:00 PM local depot time, Juniper Care next-day 3 p.m. local, FortiCare Priority RMA 3 PM local depot time **[S20]**.

4.10 Returned media.

A unit with storage that leaves the client's control is sanitized to NIST SP 800-88 Rev. 2 (final, Sep 26, 2025) with a certificate per device giving serial, method and date (R25) **[S12]**, or its media stay with the client under a non-return service where the contract provides one [A] (§5 D11).

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4.11 Lifecycle and license record.

At handover every serial carries the fields in R26: for Cisco the lifecycle dates the EoX API returns (external announcement, end of sale, end of software maintenance, end of security vulnerability support, end of routine failure analysis, end of service-contract renewal, end of service attach, last date of support) **[S17]**, for other lines the vendor's equivalent [A]. The record is delivered in the client's asset-register import format keyed on serial (R27) and as a signed PDF [A]; SRA-SPD-001 and INT-005 describe the register that consumes it.

4.12 Security of the record and the exchange.

Order, ship-notice and record exchanges with the client and suppliers travel encrypted (AS2, SFTP or HTTPS with TLS 1.2 or later) [A]. Staged configurations that contain secrets and the record spine are stored encrypted, and access to them is logged to the client's collector for the engagement [A]. A security incident affecting the client's data or equipment in Symbeeo's custody is reported within 24 hours (SDD-INT-001 §9).

5 · Options and platform choices

Vendors are named only as options; where a product is named it is a line-card vendor's. Cost bands are relative, low / mid / high [A].

Table 4. Options and platform choices

ID	Decision	Requirement	Alternatives considered	Decision taken	Rationale
D1	Order path	R2, R3, R6	(a) one desk and one queue across every line: cost mid · (b) one desk per vendor: cost mid, fails R2 · (c) client contracts each vendor directly; Symbeeo stages and delivers only: cost low for Symbeeo	**(a)**, with (c) offered where the client prefers direct contracting	(a) is the capability's definition and the peer pattern [S19]; (c) is a published buyer practice (a large enterprise signed its IT services, cloud and ERP suppliers separately) [S19], so the desk supports it and R2–R6 then apply to the client's own orders by agreement [A]
D2	What confirms allocation before a date is committed	R5, R6, R7	(a) machine-readable acknowledgment: X12 855 / EANCOM ORDRSP [S14] [S15]: cost mid to set up · (b) vendor or distributor order-status portal, recorded by screenshot: cost low · (c) emailed promise: cost low	**(a) where the partner supports it, else (b)**; (c) never commits a date	(a) carries quantity and date per line and can be matched automatically; (b) is evidence but manual [A]; (c) is not a confirmation a buyer can audit [A]
D3	Authenticity check at receipt	R9	(a) cryptographic device or platform identity: Cisco SUDI [S9], Dell SCV [S10], HPE iLO 7 SPDM attestation [S11*], TCG Platform Certificate [S8*]: cost low per unit · (b) serial lookup against the manufacturer's record plus inspection: cost mid (manual) · (c) inspection only: cost low	**(a) where the product carries an identity, else (b)**; (c) rejected	Counterfeit and tainted components are the risk NIST SP 800-161r1 names [S6] and ISO/IEC 20243-1:2023 addresses [S7]; (a) is the only check a copied label cannot pass; (c) fails R9
D4	Burn-in duration	R12	(a) 24 h per server, switch and storage unit; 5 h per accelerated-compute node: cost mid · (b) 72 h per rack (INT-003 target): cost high · (c) power-on self-test only, as the published HPE and Dell factory-integration scopes state no duration [S21]: cost low	**(a) as the floor; (b) where the client specifies it**	(a) is the duration a public buyer wrote into a 2025 contract with a QA record per device [S18]; (b) ties up positions three times as long with no published evidence it finds more faults [A]; (c) fails R12

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ID	Decision	Requirement	Alternatives considered	Decision taken	Rationale
D5	Labeling scheme	R13, R14	(a) ANSI/TIA-606-D identifiers plus an asset tag with a 2D code of the serial [S3]: cost low · (b) the client's legacy scheme only: cost low · (c) vendor factory labels only	**(a)**; the client's legacy identifier is carried as a field in the record	606-D gives an identifier and a record for every space, rack, port and cable [S3]; (b) is kept as a cross-reference so no site loses its scheme [A]; (c) does not identify position or cable
D6	Shipping identity and notice	R16, R8	(a) SSCC on a GS1-128 label and an advance ship notice (X12 856 or DESADV) [S15*] [S14]: cost low · (b) packing list in the crate: cost low	**(a)**	The site can receive by scanning one label per logistics unit and reconcile serials before opening a crate [S15]; (b) is read only after the crate is open [A]
D7	Pre-shipment sign-off	R15	(a) Symbeeo quality lead signs every rack; client witness optional, in person or by video: cost low · (b) client factory acceptance on the floor mandatory for every rack: cost high for the client · (c) no sign-off; test on site: cost low here, high on site	**(a)**	Pre-shipment sign-off is the peer practice that lets equipment arrive site-ready [S19]; (b) is offered when the client asks [A]; (c) moves fault-finding into the change window, the cost the integration center exists to avoid [S19]
D8	Spares and RMA model	R21, R22, R23	(a) Symbeeo-held pool, pre-staged, refilled by vendor advance replacement (INT-006): cost mid · (b) vendor advance replacement direct to site only: cost low · (c) client holds its own spares: cost mid for the client	**(a) for every site class; (b) remains the vendor's obligation underneath**	(a) is the only model where one queue serves every line and the site receives a unit already at its baseline [A]; (b) alone gives each vendor's cutoff and each vendor's process [S20]; (c) leaves the client staging its own spares
D9	Basis for the quality and custody process	R10, R13, R17	(a) processes documented to ISO 9001:2026 (published Sep 16, 2026) [S4] and ISO 28000:2022 [S5*], certification not claimed: cost low · (b) ISO 9001:2015: superseded; certificates valid only to the end of the transition [S4*] · (c) no stated basis	**(a)**	A buyer can read each record against a named clause set [A]; (b) is superseded [S4]; certification of the floor is a separate decision for the Founder and is not stated as held
D10	Handover record format	R26, R27	(a) the client's asset-register import format keyed on serial, plus a signed PDF: cost low · (b) PDF only: cost low	**(a)**	(b) cannot be reconciled by machine, so R27 cannot be measured [A]
D11	Returned storage media	R25	(a) sanitize to NIST SP 800-88 Rev. 2 before the unit leaves the client's control, certificate per device [S12]: cost low · (b) non-return service where the vendor sells one (e.g. FortiCare Secure RMA) [S20]: cost mid · (c) ship unsanitized under the vendor's own process: cost low	**(a) by default; (b) where the media cannot be sanitized or the client's data class requires it**	(c) rejected: data leaves the client's control without a certificate

6 · Failure conditions

Table 5. Failure conditions

#	Condition	What the client sees	Recovers by itself	Needs a hand	Time
F1	Supplier acknowledges a later date or a short allocation	date not committed; notice within 1 business day (R7)	no	desk offers an alternative line as a change order	1 business day [A]

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#	Condition	What the client sees	Recovers by itself	Needs a hand	Time
F2	Part reaches end of sale between quotation and order	substitution proposed	no	change order; quotation re-issued	2 business days [A]
F3	Serial or quantity does not match the ship notice at the dock	line held at receipt	no	supplier claim	same day [A]
F4	Authenticity check fails	unit quarantined; reported to supplier, manufacturer and client	no	replacement from an authorized source	1 business day to report [A]
F5	Unit fails burn-in	none, if caught before ship	no	unit swapped; rack re-burned 24 h	1–2 days [A]
F6	Firmware drift found at the post-burn-in read	none	no	unit re-baselined; G5 re-run	hours [A]
F7	Power lost to a burn-in position	log shows the gap	no	burn-in clock restarts	duration of R12 [A]
F8	Pre-shipment sign-off refused	rack held; defect list issued	no	defects fixed; checklist re-run	1–3 days [A]
F9	Shock or tilt above the crate's rating in transit	on-site visual check and power-on test before acceptance	no	site engineer (SRA-IMP-001)	hours [A]
F10	Delivery misses the committed date	exception logged with cause; window rebooked	no	desk and carrier	per case [A]
F11	No pool spare of the failed model	vendor advance replacement ships direct to site	vendor process	pool refilled	vendor's level [S20]
F12	Vendor refuses an RMA	case escalated; client told the reason	no	escalation per SDD-INT-001 §8	1 business day [A]
F13	Record spine unavailable	nothing ships: no record, no shipment	no	restore from backup	≤ 4 h [A]

7 · Validation

None yet. The acceptance test at the first engagement under this document runs STP-INT-001 in full: order accuracy and allocation confirmation over the first orders, a staging quality record per unit, burn-in, labeling, pre-shipment sign-off, delivery against schedule, an RMA drill per vendor line and the handover import. The results are recorded here, which makes this a validated architecture.

8 · Operations and lessons learned

Day 2: weekly desk measures per engagement (order accuracy R6, date changes R7, deliveries on time R19, shipment errors R20, RMA dispatch and turnaround R22–R24); lifecycle dates read again from each vendor before every quotation and quarterly for the spares pool; firmware baselines read again on the day of staging; spares pool counts reconciled monthly against installed count. Staging capacity per engagement is stated on the quote, never in this

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document (disclosure rule). Lessons: to be written by the signing engineer after the first engagement under this document.

9 · Appendix

9.1 Glossary.

ASN advance ship notice (X12 856, EANCOM DESADV) · EoX Cisco end-of-life data · ESD electrostatic discharge · IDevID initial device identity (IEEE 802.1AR) · NBD next business day · ORDRSP order response (EANCOM) · RMA return material authorization · SCV Dell Secured Component Verification · SPDM Security Protocol and Data Model · SSCC serial shipping container code · SUDI Cisco Secure Unique Device Identifier.

9.2 Related scope.

The capability is the order desk and integration center, as peer practice defines it. Supplier data exchange on the Catena-X data space is outside it: INT-002 covers that use case, a battery passport issued and exchanged over a Dataspace Protocol connector, as a design study with its own requirements, parts table, sources and failure behavior.

9.3 2026 standards and sources, read Sep 24, 2026.

Every standard, vendor mechanism and buyer term this document relies on, checked against the owner's page on Sep 24, 2026 unless marked.

Table 6. 2026 standards and sources, read Sep 24, 2026

#	Item	Status read Sep 24, 2026	Tag	URL
S1	ISO/IEC/IEEE 29148:2018, requirements engineering	current; last reviewed and confirmed 2024; a DIS revision is in progress	[S*] published summary; iso.org not opened	https://www.iso.org/standard/72089.html
S2	ANSI/TIA-942-C, data center telecommunications infrastructure	current edition C, published May 2024; 800 mm minimum cabinet width in distribution areas	[S] TIA page (edition) · [S*] date and cabinet rule from TIA white paper summary	https://tiaonline.org/products-and-services/tia942certification/ansi-tia-942-standard/ · https://tiaonline.org/wp-content/uploads/2024/05/TIA-942-C-DC-infrastructure-stadard_TIA-white-paper.pdf
S3	ANSI/TIA-606-D, administration (identifiers, labels, records, classes 1–4)	published October 2021; current; covers AIM systems and remote powering	[S]	https://www.tiafotc.org/tia-standards-update/tia-606-d/
S4	ISO 9001:2026, quality management systems	published Sep 16, 2026 by ISO/TC 176/SC 2, sixth edition, replaces ISO 9001:2015; transition 3 years to Sep 30, 2029	[S] DQS page (publication) · [S*] transition date from published summary; iso.org could not be opened	https://www.dqsglobal.com/en/explore/focus-area/iso-9001-revision-at-a-glance · https://www.iso.org/standard/88464.html
S5	ISO 28000:2022, security and resilience — security management systems	current; published Mar 15, 2022; replaces ISO 28000:2007	[S*] published summary	https://www.iso.org/standard/79612.html

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#	Item	Status read Sep 24, 2026	Tag	URL
S6	NIST SP 800-161r1 update 1, cybersecurity supply chain risk management	final, Nov 1, 2024; names counterfeit components; no Rev. 2 listed	[S]	https://csrc.nist.gov/pubs/sp/800/161/r1/upd1/final
S7	ISO/IEC 20243-1:2023, O-TTPS — mitigating maliciously tainted and counterfeit products	current, 2023 edition	[S*] published summary	https://www.iso.org/standard/86338.html
S8	TCG Platform Certificate Profile	version 2.0 revision 39 (Jul 29, 2024) published; 2.1 in draft	[S*] published summary; TCG page could not be opened	https://trustedcomputinggroup.org/resource/tcg-platform-certificate-profile/
S9	Cisco Secure Unique Device Identifier (SUDI), Trustworthy technologies	IEEE 802.1AR X.509 certificate, key stored in the Trust Anchor module at manufacture, bound to product ID and serial; page updated Dec 7, 2023	[S]	https://www.cisco.com/c/en/us/td/docs/dcn/whitepapers/cisco-trustworthy-technologies-nexus-9000.html
S10	Dell Secured Component Verification (on device and on cloud)	factory-signed platform certificate; recipient validates delivered inventory; article last modified May 19, 2026	[S]	https://www.dell.com/support/kbdoc/en-us/000221396/what-is-dell-trusted-device-secured-component-verification
S11	HPE ProLiant Compute Gen12, iLO 7 component attestation (SPDM), factory IDevID	per search summaries of HPE's Gen12 security QuickSpecs; HPE page could not be opened	[S*]	https://www.hpe.com/us/en/collaterals/collateral.a50009218enw.html
S12	NIST SP 800-88 Rev. 2, guidelines for media sanitization	final, Sep 26, 2025; supersedes Rev. 1 (2014)	[S]	https://csrc.nist.gov/pubs/sp/800/88/r2/final
S13	ANSI/ESD S20.20-2021, ESD control program	current; replaced the 2014 edition; certifications reference 2021 from Jul 1, 2023	[S*] published summary	https://www.esda.org/store/standards/product/314/ansiesd-s20-20-2021/
S14	X12 supply chain transaction flow: 850, 855, 860, 865, 856, 861, 810	as listed on X12's own page; page states no single current release	[S]	https://x12.org/flow/supply-chain
S15	GS1 SSCC (18 digits, logistic unit), GS1-128 logistic label, EANCOM DESADV	current GS1 standards	[S*] published summary; gs1.org could not be opened	https://www.gs1.org/standards/id-keys/sscc · https://www.gs1.org/standards/edi-xml-gs1-eancom/eancom-desadv-s4/syntax-4
S16	Cisco Products End-of-Life Policy	end-of-sale notice typically 6 months ahead; last ship 3 months after end of sale; hardware support 5 years from end of sale	[S]	https://www.cisco.com/c/en/us/products/eos-eol-policy.html

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#	Item	Status read Sep 24, 2026	Tag	URL
S17	Cisco Support APIs, EoX API	version 5.0; 20 product IDs, serials or releases per request; 50 records a page; lifecycle dates as listed in §4.11	[S]	https://developer.cisco.com/docs/support-apis/eox/
S18	Public buyer terms: Texas A&M / WWT DGX SuperPOD (burn-in 5 h per DGX, 24 h per Dell server, switch and storage unit, QA record per device, rack photographs); Cook County / CDW-G 2410-06131 (98 % order accuracy, < 2 % shipment errors, products not end-of-life or end-of-sale, support SLAs by severity on the quote)	read Sep 24, 2026 in the source documents at the URLs given	[S] via that research	https://assets.system.tamus.edu/files/budgets-acct/pdf/SB20_Contracts/AB0990978.pdf · https://opendocs.cookcountyil.gov/procurement/contracts/2410-06131.pdf
S19	Peer practice: Presidio central rack integration with pre-shipment sign-off (≈ 400 components, 90+ racks); WWT integration centers; Accenture data-center supply chain for Microsoft; Xerox direct contracting	Presidio page read Sep 24, 2026; others as published at the URLs given	[S]	https://www.presidio.com/learn-from-us/case-studies/leading-global-manufacturer-site-ready-infrastructure/ · https://www.wwt.com/location/north-american-integration-center · https://www.accenture.com/us-en/case-studies/ai-data/microsoft-reaches-sky-scaling-cloud-at-speed-of-ai
S20	Vendor RMA terms: Cisco Support service description Ver 2.1 of Jul 24, 2026 (Smart Net Total Care renamed Cisco Support from Jun 15, 2025; its portal and services APIs retired Nov 27, 2025); Juniper Care 017-EN; FortiCare Priority RMA and Secure RMA	Cisco read Sep 27, 2026: 8x5xNBD and 8x7xNCD cutoff 3:00 PM local depot time, 8x5x4 no longer offered on orders from Apr 24, 2026; Juniper and Fortinet read 2026-09-18/20	[S] Cisco as of Sep 27, 2026; others as of Sep 20, 2026	https://www.cisco.com/c/dam/en_us/about/doing_business/legal/service_descriptions/docs/Cisco-Support.pdf · https://www.cisco.com/c/dam/en/us/support/docs/services/sntc/migration/sntc-to-cx-cloud-migration-guide.pdf · https://support.juniper.net/support/pdf/guidelines/juniper-care-service-description-document.pdf · https://www.fortinet.com/content/dam/fortinet/assets/solution-guides/sb-forticare-priority-rma.pdf
S21	HPE Factory Express Level 4 and Dell Rack Integration Services data sheets: no burn-in duration published	Dell read Sep 20, 2026; HPE read Sep 27, 2026 as Rev. 5 (PDF of Jun 29, 2026); neither publishes a burn-in duration	[S] HPE as of Sep 27, 2026; Dell as of Sep 20, 2026	https://www.hpe.com/us/en/collaterals/collateral.a50003229enw.html · https://assets.ext.hpe.com/is/content/hpedam/a50003229enw · https://www.delltechnologies.com/asset/en-my/solutions/infrastructure-solutions/technical-support/enterprise_rack_integration_services_data_sheet.pdf

9.4 · Industry rules this architecture helps a buyer meet.

From Symbeeo's industry research of September 2026. Only rules that research links to this document's requirements are listed; rules it found this document does not address are left out.

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Table 7. Industry rules this architecture helps a buyer meet

Rule	Jurisdiction	What it asks of infrastructure	Requirements here	Coverage
HIPAA Security Rule, 45 CFR Part 164 Subpart C (the January 2025 proposed update is not final)	US · covered entities and business associates	device and media controls: disposal and re-use of media holding ePHI	R25	partial
NIST SP 800-88 Rev. 2 (final, Sep 2025)	US · named in customer contracts	storage media sanitized to a stated method, with a record, before it leaves control	R25	full
PCI DSS v4.0.1 (Jun 2024)	Card schemes · any merchant or service provider	Req. 9.4.7: electronic media destroyed or rendered unrecoverable when no longer needed	R25	full
ANSI/TIA-942-C (2024) and ANSI/TIA-606-D (2021)	US (ANSI) · named in customer specifications	TIA-606-D identifiers and records for racks, units, ports and cables	R14	full
NERC CIP-013-2 (enforceable; CIP-013-3 from Jul 1, 2028)	US and Canada · Bulk Electric System entities	a supply-chain cyber-risk plan covering procurement, vendor risk, software integrity and vendor remote access	R9	full
ISPE GAMP 5 Second Edition (Jul 2022)	Industry guidance · GxP-regulated firms worldwide	risk-based qualification of infrastructure, with lifecycle records	R13	partial

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 §9.4, read Sep 25, 2026: 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` · NIST SP 800-88 Rev. 2 [S] `https://csrc.nist.gov/pubs/sp/800/88/r2/final` · PCI DSS v4.0.1 [S] `https://www.pcisecuritystandards.org/document_library/` (version); requirement numbers [S*] from secondary summaries, the standard sits behind a license click-through · ANSI/TIA-942-C [S] `https://store.accuristech.com/standards/tia-ansi-tia-942-c?product_id=2902413` · ANSI/TIA-606-D [S] `https://store.accuristech.com/standards/tia-ansi-tia-606-d?product_id=2594255` · NERC CIP-013-2 [S] `https://www.nerc.com/standards/reliability-standards/cip/cip-013-2` · GAMP 5 Second Edition [S] `https://ispe.org/publications/guidance-documents/gamp-5-guide-2nd-edition`.

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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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