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DESIGN STUDY

SD-WAN and SASE for 40 retail stores replacing MPLS

Complete design on current platforms

CAPABILITY	INDUSTRY	SETTING
Networking	Retail	Specialty retailer
DOCUMENT	**VERSION**	**DATE**
NET-004	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. Mark Winston remains the author.

1 · Scope

Who it is for. The IT director of a specialty retailer on an MPLS contract that renews in twelve months, with stores that need point-of-sale, inventory and video to stay up when one circuit fails, and staff devices that leave the store network.

Typical buyer [A]. A specialty retailer, 40 stores across two countries, 8 to 25 staff per store, one point-of-sale VLAN, one back-office VLAN, one guest SSID per store. Two data centers host the ERP; SaaS for email, HR and collaboration. Incumbent MPLS at 20–50 Mbps per store.

What is in. Per-store SD-WAN edge, dual broadband plus 5G transports, hub termination at the two data centers, SASE for staff devices, and the MPLS retirement sequence. **What is out.** In-store LAN switching and Wi-Fi beyond the edge's built-in ports (assumed existing, [A]); data-center security policy; PCI scope documentation (the design places the segmentation; the assessor decides the scope).

Assumptions. Fortinet is the SD-WAN, edge and SASE vendor [A]. Each store can get two broadband circuits from different providers at 100 Mbps or better [A]. 5G coverage exists at every store [A]. The two data centers already run FortiGate firewalls that can act as hubs [A].

Related documents, read Sep 18, 2026.

- FortiGate FortiWiFi 70G Series data sheet page — https://www.fortinet.com/resources/data-sheets/fortigate-fortiwifi-70g-series
- Fortinet Product Matrix (FortiGate 70G, 90G, 120G figures) — https://www.fortinet.com/content/dam/fortinet/assets/data-sheets/Fortinet_Product_Matrix.pdf
- FortiGate Rugged Series data sheet, FGR-70G-5G-DUAL columns (the 70G-5G-DUAL introduction PDF now redirects here; read Sep 27, 2026) — https://www.fortinet.com/content/dam/fortinet/assets/data-sheets/FortiGate_Rugged_Series.pdf
- FortiSASE product page — https://www.fortinet.com/products/sase
- Fortinet customer story, Secure SD-WAN compliance for more than 1,000 retail locations (Mar 8, 2021), read Sep 20, 2026 — https://www.fortinet.com/blog/customer-stories/fortinet-secure-sdwan-provides-compliance-for-retail-locations

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- Fortinet customer story, major retailer converges network and security with Secure SD-WAN (Jun 15, 2022), read Sep 20, 2026 — https://www.fortinet.com/blog/customer-stories/retailer-consolidates-network-security-systems-with-fortinet-secure-sd-wan

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
Deployment. Secure SD-WAN for more than 1,000 retail locations (North American retailer)	Fortinet · Mar 8, 2021	MPLS completely replaced by SD-WAN over dedicated internet access with FortiExtender cellular for redundancy; FortiManager and FortiAnalyzer for central management — the R3 end state and the §4.2 cellular role, at 25× this design's store count	https://www.fortinet.com/blog/customer-stories/fortinet-secure-sdwan-provides-compliance-for-retail-locations
Deployment. Major retailer, 1,700+ stores, converges network and security with Secure SD-WAN	Fortinet · Jun 15, 2022	Public internet as primary with cable/DSL alongside MPLS during transition and LTE as a third link; FortiGate NGFW at every store as the SD-WAN edge — the §4.3 three-transport overlay and the §4.6 parallel-run period	https://www.fortinet.com/blog/customer-stories/retailer-consolidates-network-security-systems-with-fortinet-secure-sd-wan

Neither story publishes throughput, failover-time or cost figures, so R9, R13 and R10 are design assumptions and targets.

2 · Requirements register

Table 3. Requirements register

#	Requirement	Value	Source
R1	Stores and countries	40 stores · 2 countries	[A]
R2	Transports per store	2 × broadband + 5G	[T]
R3	MPLS	retired at contract end, month 12	[T]
R4	Store edge, firewall throughput	10 Gbps; 8 Gbps on the Rugged 70G-5G-DUAL, 40 × the 200 Mbps store peak	[S] FG-70G 10/10/10 Gbps; [S] Rugged Series data sheet, FGR-70G-5G-DUAL 8/8/8 Gbps
R5	Store edge, IPsec throughput	7.1 Gbps	[S] FG-70G
R6	Store edge, threat protection	1.3 Gbps	[S] FG-70G enterprise mix
R7	Store edge, interfaces	10 × GE RJ45; 6 × GE RJ45 + 2 × GE SFP on the Rugged 70G-5G-DUAL, five used	[S] FG-70G; [S] Rugged Series data sheet

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#	Requirement	Value	Source
R8	5G at the edge	embedded dual 5G, 2 SIM slots active/active	[S] FortiGate Rugged Series data sheet, FGR-70G-5G-DUAL
R9	Hub, IPsec throughput	≥ 120 tunnels (40 stores × 3 transports), 8 Gbps aggregate per hub; 35 Gbps available	[A]; [S] FG-120G IPsec 35 Gbps
R10	Per-store WAN cost	below the incumbent MPLS line item	[T]
R11	SASE for staff devices	SWG, ZTNA, CASB, FWaaS, DLP via FortiClient	[S] FortiSASE
R12	SASE points of presence	170+ Fortinet SSE PoPs	[S] FortiSASE
R13	Point-of-sale failover time	< 5 s on any single transport loss	[A]
R14	Store availability	99.9 % measured on the point-of-sale VLAN	[A]

Fourteen rows; eight carry a vendor figure, three are design assumptions, three are design targets.

3 · Architecture overview

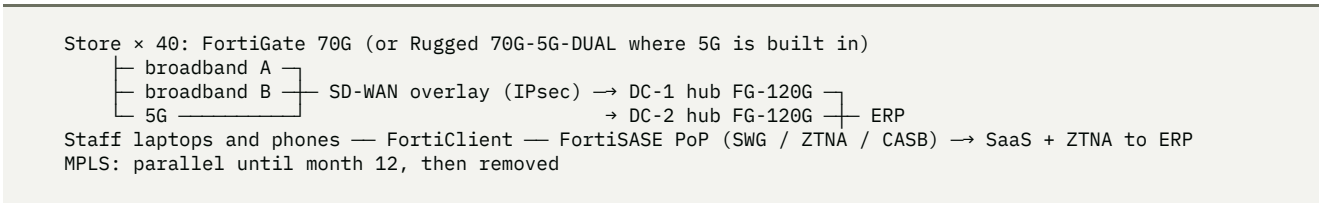


Figure 1. Store SD-WAN and SASE

One edge model in every store, two hubs, one SASE tenant. Broadband carries the load; 5G is the third path, not a backup that is never tested.

Table 4. Architecture overview

Role	Product (exact model)	Qty	Capacity used	Why this unit
Store edge, standard	Fortinet FortiGate 70G	32	10 Gbps firewall, 7.1 Gbps IPsec, 1.3 Gbps threat protection [S]; store load ≤ 200 Mbps [A]	10 × GE, SD-WAN included [S]
Store edge, 5G built in	Fortinet FortiGate Rugged 70G-5G-DUAL	8	dual 5G modem, 2 SIM active/active; 8 Gbps firewall, 7.1 Gbps IPsec, 1.3 Gbps threat protection, 6 × GE RJ45 + 2 × GE SFP [S]; store load ≤ 200 Mbps on 5 ports [A]	stores where a separate 5G router is not wanted [A]; below the standard edge's 10 Gbps and 10 ports, which no store needs (R4, R7)
5G transport, standard stores	FortiExtender (family; model not verified)	32	—	[A]
Hub, per data center	Fortinet FortiGate 120G	2	8 of 35 Gbps IPsec (23 %) [A][S]	4 × 10GE SFP+ [S]

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Role	Product (exact model)	Qty	Capacity used	Why this unit
SASE	FortiSASE, FortiClient agent	1 tenant, ~600 users [A]	170+ PoPs [S]	SWG, ZTNA, CASB, FWaaS, DLP [S]

4 · Design by subsystem

4.1 Store edge.

FortiGate 70G: 10 Gbps firewall, 7.1 Gbps IPsec, 1.3 Gbps threat protection, 10 × GE RJ45 [S]; SD-WAN and the wireless controller are included at no extra cost [S]. Ports: two WAN for broadband, one for the 5G router, remaining ports for the point-of-sale, back-office and guest VLANs [A]. Store peak load 200 Mbps [A], 2 % of the firewall figure and 15 % of threat protection; the unit is sized for the security services, not the bandwidth. Rejected: the FortiGate 90G (28 Gbps firewall, 25 Gbps IPsec [S]) — headroom no store uses.

4.2 5G transport.

Eight stores in locations where a rooftop antenna is impractical get the FortiGate Rugged 70G-5G-DUAL: two embedded 5G modems, two SIM slots active/active, 8 SMA antennas, 8 Gbps IPv4 firewall, 1.3 Gbps threat protection [S]. The other 32 stores take a FortiExtender 5G unit on a WAN port; the exact model is not verified on the vendor page and is named by family only [A]. 5G carries live traffic (guest SSID by policy) so its health is proven every day [A].

4.3 SD-WAN overlay.

Three IPsec tunnels per store, one per transport, to each of the two hubs = six tunnels per store [A]. Point-of-sale traffic is steered by SLA: latency < 100 ms, loss < 1 %, jitter < 20 ms, measured every second [A]. Broadband A is preferred; B and 5G take over on SLA breach (R13). Rejected: active/standby broadband — a standby that never carries traffic is a broken circuit nobody notices.

4.4 Hubs.

FortiGate 120G per data center: 39 Gbps firewall, 35 Gbps IPsec, 4 × 10GE SFP+, 18 × GE RJ45, 8 × GE SFP [S]. 40 stores × 200 Mbps = 8 Gbps peak if every store peaks at once [A], 23 % of IPsec capacity. The hubs run as an active/active pair across the two data centers [A]. Rejected: reuse of the existing data-center firewalls as hubs — mixing WAN termination with the data-center policy set doubles the change window (R14, [A]).

4.5 SASE for staff devices.

FortiSASE: SWG, ZTNA, CASB, FWaaS, DLP and SSPM through the FortiClient agent, 170+ SSE PoPs [S]. Staff laptops and managed phones connect to the nearest PoP wherever they are; access to the ERP is by ZTNA policy, not by being on the store network [A]. FortiGate edges integrate with FortiSASE for the store's own traffic [S], so store guest and back-office web traffic can take the same policy [A]. Rejected: VPN back to the data center for staff — hairpins SaaS traffic through the hubs (R9).

4.6 MPLS retirement.

Months 1–3: edges installed, overlay live, MPLS still primary. Months 4–9: stores cut to the overlay in batches of five, MPLS demoted to a fourth path. Months 10–12: MPLS removed store by store; contract ends month 12 [A] (R3). Per-store cost target (R10) is set against the incumbent line item at contract signature; no figure is claimed here.

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4.7 Management.

Zero-touch provisioning per store from a central FortiManager (family; model not read, [A]); templates per country for language and regulatory settings [A].

5 · Failure behavior

Table 5. Failure behavior

Failure	Behavior	Source
Broadband A down	SD-WAN steers to broadband B within the SLA probe interval; point-of-sale sessions continue on the overlay	[A]
Both broadband circuits down	5G carries point-of-sale and back-office; guest SSID rate-limited	[A]
One 5G modem or SIM fails (Rugged 70G-5G-DUAL)	second modem active/active continues	[S] dual 5G, 2 SIM active/active
Store edge hardware fails	store offline until the spare edge is swapped and re-provisioned; target 4 hours from stock	[A]
One hub down	every store already has tunnels to the second hub; traffic shifts	[A]
SASE PoP unreachable	FortiClient reconnects to another of 170+ PoPs	[S] PoP count; [A] behavior

6 · Limits

- Per-store cost saving is a target set against the incumbent contract; this document contains no cost figure.
- The FortiExtender 5G model for the 32 standard stores is not verified and is named by family only.
- Two broadband providers per store is assumed; rural stores may have one, which changes R2 for those sites.
- SASE covers staff devices; point-of-sale terminals stay on the store network and the edge's policy.
- FortiManager is named by family; its sizing and licensing are outside this document.

7 · Lessons learned

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

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8 · The author

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Signed off by Edwin Ozer, Founder.

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SYMBEEO

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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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