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DESIGN STUDY

Bank data center network cutover designed for eight windows: 60 VLANs from a Classic Ethernet core to a VXLAN EVPN fabric

Complete design on current platforms

CAPABILITY	INDUSTRY	SETTING
Implementation Services	Financial Services	Bank
DOCUMENT	**VERSION**	**DATE**
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Sign-off	"An engagement under this design is signed by the practice lead before any build proceeds."		

Contents

1 · Scope 3
1c · Public implementations this design follows 4
2 · Requirements register 5
3 · Architecture overview 6
4 · Design by subsystem 7
5 · Failure behavior 8
6 · Limits 8
7 · Lessons learned 8
8 · The author 9

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CONVENTIONS

Source tags. [S] figure read from the vendor's or publisher's own current page on Sep 24, 2026 · [S*] figure from the publisher's summary or a secondary report, where the publisher's full text could not be read on that date · [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 27, 2026	1.0	First issue.
Oct 10, 2026	1.1	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 at a bank whose new data center fabric is installed, tested and carrying nothing, while every workload still sits behind the old core — and whose change advisory board will approve the move only in named windows, with a written rollback for each.

Typical buyer [A]. A bank with one primary data center. The old network: a Classic Ethernet aggregation pair holding the first-hop gateways (HSRP) for 60 VLANs, about 1,400 endpoints between virtual machines and bare-metal servers. The new network: a VXLAN BGP EVPN fabric on Cisco Nexus 9000 switches running NX-OS 10.5(5)M, managed by Cisco Nexus Dashboard 4.2.1, installed and tested under the Networking capability. Windows: Saturday 22:00–04:00, approved per window by the change advisory board: one pre-work window that builds the interconnect and moves nothing, then eight migration windows.

Why NX-OS 10.5(5)M. Cisco's recommended release for Nexus 9000 hardware supported with 10.5(x) is 10.5(5)M (page updated Jun 4, 2026) [S]. An M release is a maintenance release: bug and security fixes only, no new features; a train's first releases are feature (F) releases, and the newer 10.6(x) train is not the recommended release on that page [S]. A bank's change board is buying stability, so the M release is chosen [A]. The HSRP and anycast gateway coexistence this plan relies on is documented in the 10.5(x) VXLAN configuration guide [S]; it is also in the 10.4(x) guide and is not listed among the 10.5(x) new features, so it predates 10.5(1)F and is present in 10.5(5)M (inferred from the two guides; the exact introduction release is not printed on the pages read).

What is in. The Layer 2 and Layer 3 interconnect between old and new; gateway alignment; VLAN grouping and window plan; endpoint moves; gateway cutover; rollback; fiber test of the interconnect links; decommissioning of the interconnect; handover. **What is out.** The design of the new fabric (SDD-NET-001 path); the firewall and load-balancer policy; workload changes of any kind; the retirement of the old aggregation switches, which follows in a separate change.

Assumptions. Cisco is the fabric vendor, chosen before this work [A]. The border leaf pair runs vPC [A]. Every VLAN on the old core has an owner who can name its applications [A]. Endpoints move either by hypervisor live migration to hosts on the new fabric or by re-patching a bare-metal server's uplinks [A].

Related documents, read Sep 24, 2026.

- SRA-IMP-001, SDD-IMP-001, STP-IMP-001 — this capability's reference architecture, design and test plan

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- Cisco, Migrating Classic Ethernet Environments to VXLAN BGP EVPN, white paper, Aug 23, 2023 — https://www.cisco.com/c/en/us/td/docs/dcn/whitepapers/migrating-classic-ethernet-to-vxlan-bgp-evpn-white-paper.html
- Cisco Nexus 9000 Series NX-OS VXLAN Configuration Guide, Release 10.5(x), Default Gateway Coexistence of HSRP and Anycast Gateway (VXLAN EVPN), updated Apr 23, 2025, read Sep 27, 2026 — https://www.cisco.com/c/en/us/td/docs/dcn/nx-os/nexus9000/105x/configuration/vxlan/cisco-nexus-9000-series-nx-os-vxlan-configuration-guide-release-105x/m-default-gateway-coexistence-of-hsrp-and-vxlan-evpn.html
- Same guide, Release 10.5(x), New and Changed Information, updated Apr 23, 2025, read Sep 27, 2026 — https://www.cisco.com/c/en/us/td/docs/dcn/nx-os/nexus9000/105x/configuration/vxlan/cisco-nexus-9000-series-nx-os-vxlan-configuration-guide-release-105x/new-and-changed-information.html
- Same chapter, Release 10.4(x), updated Mar 29, 2024, read Sep 27, 2026 — https://www.cisco.com/c/en/us/td/docs/dcn/nx-os/nexus9000/104x/configuration/vxlan/cisco-nexus-9000-series-nx-os-vxlan-configuration-guide-release-104x/m-default-gateway-coexistence-of-hsrp-and-vxlan-evpn.html
- Cisco, Recommended Cisco NX-OS Releases for Cisco Nexus 9000 Series Switches, updated Jun 4, 2026, read Sep 27, 2026 — https://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus9000/sw/recommended_release/b_Minimum_and_Recommended_Cisco_NX-OS_Releases_for_Cisco_Nexus_9000_Series_Switches.html
- Cisco, Software Lifecycle Support Statement – Cisco NX-OS on Cisco Nexus 9000, updated Mar 11, 2026, read Sep 27, 2026 — https://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/nx-os-software/guide_c07-658595.html
- Cisco Nexus Dashboard release notes, Release 4.2.1 — https://www.cisco.com/c/en/us/td/docs/dcn/nd/4x/release-notes/cisco-nexus-dashboard-release-notes-421.html
- Cisco Nexus Dashboard 4.2.1, Creating fabrics and fabric groups — https://www.cisco.com/c/en/us/td/docs/dcn/nd/4x/articles-421/creating-lan-aci-fabrics-and-fabric-groups.html

1c · Public implementations this design follows

Table 2. Public implementations this design follows

Implementation	Who published it · date	What it settles for this design	URL
Classic Ethernet to VXLAN BGP EVPN: double-sided vPC between brownfield aggregation and greenfield border leafs; eBGP between the two; HSRP virtual MAC set to the anycast gateway MAC before any move; interconnect removed after the last move	Cisco white paper · Aug 23, 2023 · vendor documentation, used to build our own design	The step order in §4.1–§4.6, and R3–R5	https://www.cisco.com/c/en/us/td/docs/dcn/whitepapers/migrating-classic-ethernet-to-vxlan-bgp-evpn-white-paper.html
HSRP and distributed anycast gateway running at once during migration, with a shared gateway MAC and IP; migrate IPv4 and IPv6 sequentially; limit the migration to 1,000 concurrent hosts; on 9300-FX and FX2 border leafs, carve the ingress PACL region and reload before configuring the external ports	Cisco, NX-OS 10.5(x) VXLAN configuration guide · Apr 23, 2025 · vendor documentation, used to build our own design	R6–R8: window size and the border-leaf carve before the interconnect is built	https://www.cisco.com/c/en/us/td/docs/dcn/nx-os/nexus9000/105x/configuration/vxlan/cisco-nexus-9000-series-nx-os-vxlan-configuration-guide-release-105x/m-default-gateway-coexistence-of-hsrp-and-vxlan-evpn.html

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Implementation	Who published it · date	What it settles for this design	URL
Nexus Dashboard 4.2.1: automatic reconciliation of local switch changes, keeping the dashboard the single source of truth	Cisco release notes · Mar 12, 2026 · vendor documentation, used to build our own design	R9: the drift check reads the controller, not a spreadsheet	https://www.cisco.com/c/en/us/td/docs/dcn/nd/4x/release-notes/cisco-nexus-dashboard-release-notes-421.html

The white paper predates the coexistence feature; where they differ, the 10.5(x) guide governs and the white paper's "never enabled simultaneously" rule applies only to switches without it. Every row is vendor documentation: a search on Sep 27, 2026 found no bank's own published story of a Classic Ethernet to VXLAN EVPN gateway migration that could be read and dated, so no public deployment row is claimed.

2 · Requirements register

Table 3. Requirements register

#	Requirement	Value	Source
R1	Scope of move	60 VLANs · ~1,400 endpoints · one aggregation pair	[A]
R2	Windows	8 Saturday migration windows 22:00–04:00: window 1 the pilot VLAN, windows 2–8 the other 59 VLANs in seven groups; before them, one pre-work maintenance window that builds the interconnect and moves no endpoint and no gateway	[T]
R3	Layer 2 interconnect	double-sided vPC, old aggregation pair to new border leaf pair	[S] Cisco white paper
R4	Layer 3 interconnect	eBGP between the old and new networks	[S] Cisco white paper
R5	Gateway alignment	every VLAN's HSRP virtual MAC equal to the fabric's anycast gateway MAC before its first move	[S] Cisco white paper
R6	Hosts in migration	≤ 1,000 concurrent hosts in coexistence; this plan holds ≤ 250 per window: about 1,370 endpoints over windows 2–8 is about 196 per window	[S] NX-OS 10.5(x) guide; [T] 250
R7	Address families	IPv4 and IPv6 of a VLAN migrated in sequence, not together	[S] NX-OS 10.5(x) guide
R8	Border leaf check	if the border leafs are 9300-FX or FX2, ingress PACL region carved and each border leaf reloaded before the interconnect ports are configured	[S] NX-OS 10.5(x) guide
R9	Configuration source	every fabric change pushed from Nexus Dashboard; drift reads zero at each window close	[S] ND 4.2.1 reconciliation; [T] zero

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#	Requirement	Value	Source
R10	Window control	go/no-go signed by the change advisory board; rollback trigger 02:30	[A]; SRA-IMP-001 R12
R11	Rollback rehearsal	pilot VLAN moved, rolled back end to end, and moved again, all inside window 1, before window 2	[T]; SRA-IMP-001 R13
R12	Loss per gateway cutover	≤ 3 s of loss on a continuous probe per VLAN	[T]
R13	Interconnect fiber	every interconnect connector inspected to IEC 61300-3-35 ed. 3; every link tested to ISO/IEC 14763-3:2024	[S] (from SRA-IMP-001 R10, R11)
R14	Interconnect removal	Layer 2 interconnect removed ≤ 30 days after the last window	[T]

Fourteen rows; eight carry a vendor or standards figure, two are design assumptions, four are design targets.

3 · Architecture overview

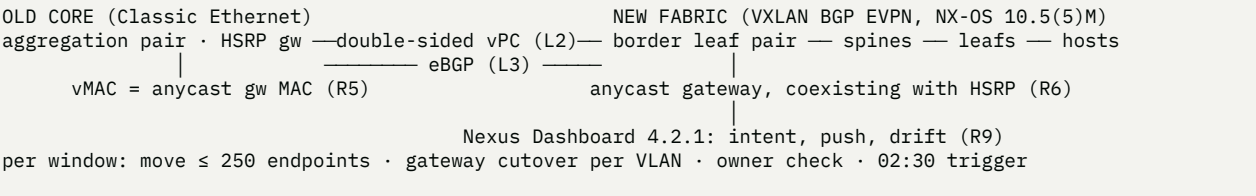


Figure 1. Classic Ethernet to VXLAN EVPN migration

The two networks run as one Layer 2 domain for the life of the migration, joined at the border leafs, so an endpoint can move without changing its address or its gateway MAC. The gateway itself moves VLAN by VLAN once its endpoints have moved.

Table 4. Architecture overview

Role	Product (exact version)	Qty	Capacity used	Why this unit
Fabric controller	Cisco Nexus Dashboard 4.2.1	1 cluster [A]	the new fabric	brownfield and VXLAN fabric types; reconciliation of local changes [S]
Fabric switches	Cisco Nexus 9000, NX-OS 10.5(5)M	as installed [A]	60 VLANs as L2 VNIs with anycast gateway [A]	Cisco's recommended release for 10.5(x) hardware; HSRP and anycast gateway coexistence in the 10.5(x) guide [S]
Old core	Classic Ethernet aggregation pair	2	HSRP for 60 VLANs [A]	the network being left
Interconnect	double-sided vPC plus eBGP	1	60 VLANs trunked [A]	the Cisco migration method [S]
Source of truth	Nexus Dashboard for the fabric; the client's IPAM for addresses	—	[A]	SRA-IMP-001 D2: the client's own system where it runs one

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4 · Design by subsystem

4.1 Pre-work.

Fiber for the interconnect inspected and tested to R13 [S]. Border leaf platform read; if 9300-FX or FX2, the ingress PACL region is carved and the switch reloaded before the ports facing the old core are configured [S]. The carve is done while the new fabric still carries no traffic, one border leaf at a time, as a logged change on the fabric; it touches no production system, so it takes no Saturday window [A]. Every VLAN's owner, applications and endpoints listed; VLANs grouped so an application's tiers move in one window [A].

4.2 Interconnect, in the pre-work window.

Double-sided vPC between the old aggregation pair and the new border leafs, trunking the 60 VLANs; eBGP between the two for routed traffic [S]. The border-leaf ports facing the old core are set as external ports, and the vPC border leaf pair runs peer-gateway and Layer 3 peer-router [S]. Because this touches the production aggregation pair, it is built and tested in a pre-work window: a Saturday 22:00–04:00 maintenance change the change advisory board approves on its own, before window 1. It is not one of the eight migration windows and moves no endpoint and no gateway [A].

4.3 Gateway alignment.

For each VLAN, the HSRP virtual MAC on the old core is set to the fabric's anycast gateway MAC [S], then an HSRP state change makes endpoints refresh their ARP cache [S]. From here an endpoint sees the same gateway MAC whichever side it sits on.

4.4 Endpoint moves.

Per window, up to 250 endpoints (R6): virtual machines by live migration to hosts on the new leafs, bare-metal servers by re-patching both uplinks [A]. While HSRP and the anycast gateway coexist, traffic between subnets may still cross the interconnect to the old gateway; that is expected and is what the Cisco paper describes as trombone traffic [S]. IPv4 first, then IPv6, for each VLAN (R7).

4.4a The eight migration windows.

Window 1 carries the pilot VLAN alone, at most 30 endpoints [A]: endpoints moved and the gateway cut over (§4.5), owner's check, then the whole VLAN rolled back end to end as the rehearsal (R11: HSRP restored on the old core, anycast gateway withdrawn, endpoints moved back), then moved and cut over again. The second move must pass the owner's check by the 02:30 trigger; if it does not, the pilot rolls back and stays on the old core, and the plan is reviewed before window 2 [A]. Windows 2–8 carry the other 59 VLANs in seven groups: about 1,370 endpoints over seven windows is about 196 per window, inside the 250 of R6 [T]. Eight migration windows in all, plus the one pre-work window of §4.2 that moves nothing.

4.5 Gateway cutover.

Once a VLAN has no endpoint left on the old side, HSRP is removed from the old core and the anycast gateway alone serves the VLAN [S]. A continuous probe per VLAN measures the loss (R12) [T]. The VLAN's owner checks the application [A].

4.6 Close.

Drift check from Nexus Dashboard reads zero at the close of every window (R9). After the last window the interconnect carries no traffic for 14 days, then is removed (R14) [A]; the old aggregation pair's retirement goes to its own change.

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5 · Failure behavior

Table 5. Failure behavior

Failure	Behavior	Source
Endpoint unreachable after its move	endpoint moved back across the interconnect; gateway unchanged	[A]
Owner's check fails after gateway cutover	HSRP restored on the old core for that VLAN before 02:30; anycast gateway withdrawn	[A] R10
Loss above 3 s on a cutover	cutover of remaining VLANs stops; result reviewed before the next window	[T] R12
Interconnect link fails	vPC holds on the surviving member; window continues only if both members are back by go/no-go	[A]
Local change found on a switch	Nexus Dashboard reconciles; the change is raised as a change order or reverted	[S] reconciliation; [A] rule
Board withholds go	window canceled; nothing changes; next Saturday	[A]; SRA-IMP-001 F5

6 · Limits

- 250 endpoints per window is a planning figure well inside the 1,000-host limit; the real figure is set by how many owners can check in one window.
- The 3 s loss target is not a vendor figure and is measured, not predicted.
- Applications that pin a gateway by address or run their own gateway redundancy are found in pre-work and planned individually.
- The white paper was published before the coexistence feature documented in the 10.5(x) guide; its sequence is used, its "never simultaneously" rule is not.
- The pre-work window is a ninth Saturday change; the eight in the title are the windows that move endpoints and gateways.
- NX-OS 10.5(5)M is Cisco's recommendation as of Jun 4, 2026; a later 10.5 maintenance release published before the build is reviewed against its resolved caveats, as the recommendation page itself advises.
- Retirement of the old aggregation pair is outside this plan.

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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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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