

Passive fiber infrastructure for AI clusters

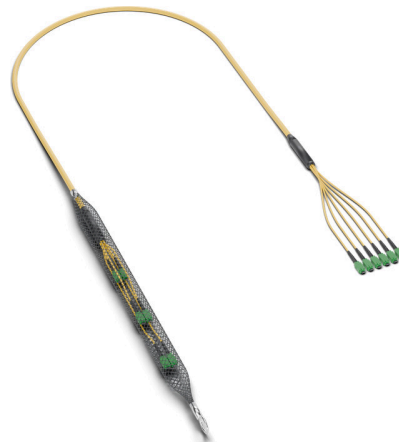
Entrance-to-rack connectivity for NVIDIA HGX B200/B300 nodes and GB200/GB300 NVL72 rack-scale systems: high-count splicing, MPO/MTP trunking and dense patch fields, built to order in Henderson, NV.

DATA CENTER ENGINEERS

NETWORK ARCHITECTS

INTEGRATORS

COLOCATION & NEOCLOUDS



HD9U stack (three HD3U enclosures) and an MPOT- MPO trunk.

OVERVIEW

Every GPU adds fiber. We build the plant it plugs into.

AI clusters multiply the fiber in a data hall. Each GPU gets its own scale-out network port, rail-optimized fabrics add leaf and spine tiers, and storage, in-band and out-of-band networks run alongside. The optics are yours; One Optics supplies the passive plant they plug into, from the cabinet where the OSP cable lands to the jumper at the node, configured to order and tested in Henderson.

6,912_F

OSP CABLE PER FEC-
6912

1,728_F

SPLICES IN 3U
(HD3US)

432_{LC}

PORTS IN 3U (HD3U)

288_F

MAX MPO TRUNK
(MPOT-)

WHAT WE SUPPLY

- **Enclosures:** FEC-6912 entrance cabinet, HD3US splice panel, HD3U / HD6U / HD9U, HD1U, HD Slim 1U
- **Modules:** HD adaptor plates (LC, SC, MTP, Cat 6), MPO pass-through and OOFc splice cassettes
- **Cable assemblies:** MPO trunks, MPO jumpers, LC/SC jumpers, pigtails, Cat 6 jumpers

SUPPLIED BY OTHERS

- Transceivers and optics (OSFP, QSFP), DAC and AOC cables
- GPU servers, NVLink systems, switches, NICs and DPUs
- Racks, cable tray and pathway; OSP cable placement

THE CHALLENGE

Fiber counts that outgrow the room

NVIDIA's published DGX SuperPOD reference architectures build the compute fabric as a rail-optimized, non-blocking fat tree. A DGX B200 scalable unit holds 32 systems with eight 400 Gb/s compute connections each; the four-SU reference design lists 1,020 node-to-leaf and 1,024 leaf-to-spine cables, before storage, in-band and management networks. Rack-scale GB200 and GB300 NVL72 systems keep NVLink inside the rack, but each of the 18 compute trays still carries four scale-out ports at the front of the rack.

TIA-942-C lays the room out as a hierarchical star (entrance room, MDA, optional HDA, equipment rows) and limits direct-attach cabling to the same or adjacent cabinets. Common practice is direct links from GPU nodes to leaf switches within a row and structured cabling from leaf to spine and beyond, so tray capacity holds and the plant survives the next optic.

DESIGN NOTES

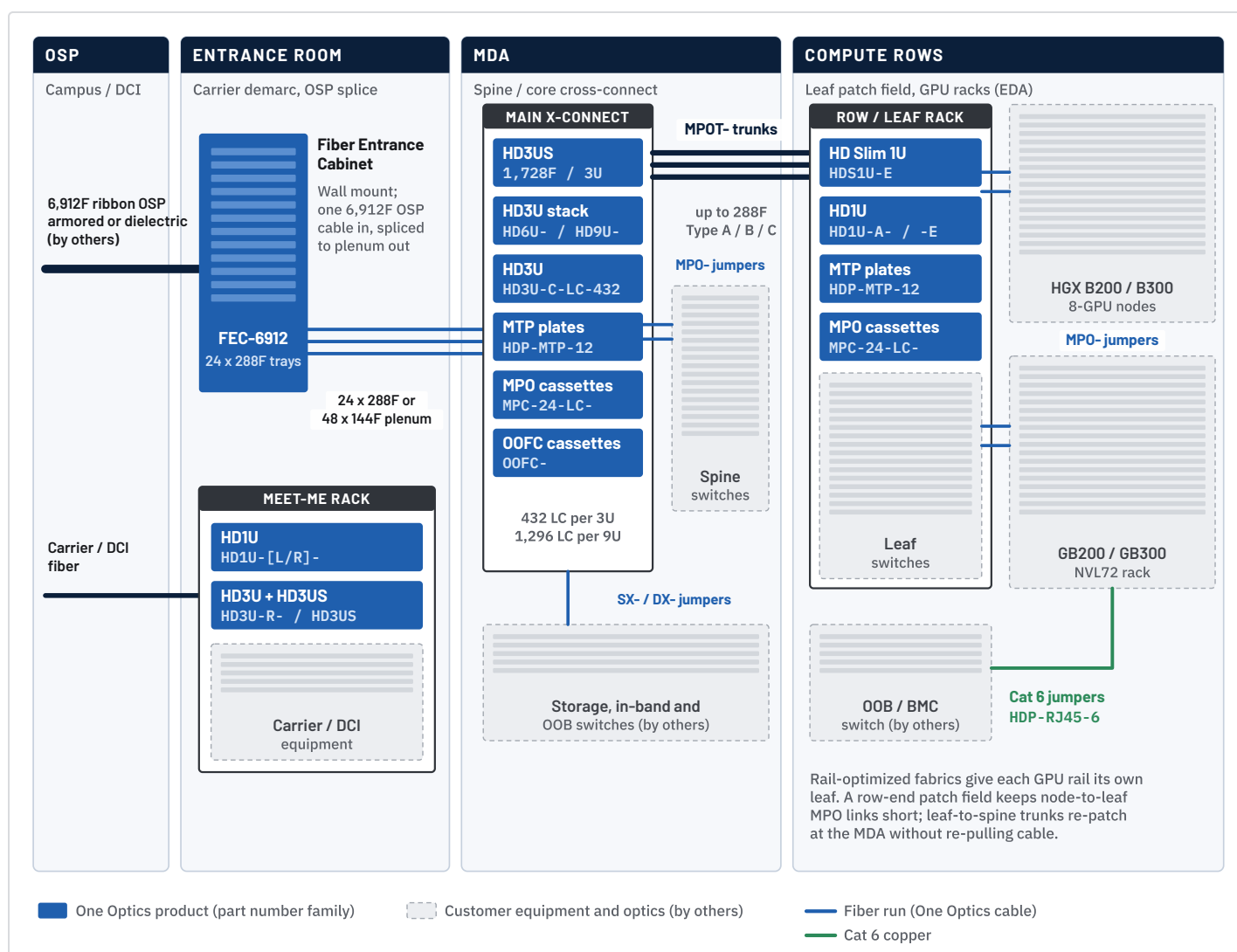
Polarity end to end. Pair Type A, B or C trunks with matching jumpers and cassettes (MPC-24-LC-A or -U).

Polish follows the optic. NVIDIA's InfiniBand parallel optics use MPO/APC; confirm the connector for every optic you deploy.

Fiber type follows the optic. Singlemode is our standard; multimode on request.

Reach. Check link length limits in the optic vendor's cabling guide before fixing trunk lengths.

WHERE ONE OPTICS FITS · ENTRANCE TO RACK



Simplified, not to scale. Zones follow TIA-942-C naming. Switch, server and optic counts depend on the cluster design; One Optics supplies the passive connectivity shown in blue.

PRODUCT FIT

From the entrance cabinet to the GPU rack

	PRODUCT	PART NUMBERS	ZONE	ROLE IN THE CLUSTER
	Fiber Entrance Cabinet 44.5 x 21.5 x 13.25 in, aluminum	FEC-6912 FEC-UMK	Entrance room	Lands the customer's 6,912F armored or dielectric ribbon OSP cable (top or bottom entry) and splices it to 24 x 288F or 48 x 144F plenum cables (PTP-plenum preterms) on 24 trays. Optional strut-mount kit.
	HD3US splice panel 3U, splice only	HD3US	Entrance · MDA	6 trays x 288F = 1,728F in 3U. Splices the ribbon pigtails of up to six HD3U enclosures dropped through their knockouts.
	HD3U enclosure 3U rack mount	HD3U- [L/R/C/A] -	MDA · HDA	Up to 432 LC in 3U (HD3U-C-LC-432 cassette build), 288 LC ribbon, 144F loose tube. Main cross-connect for spine and core.
	HD6U / HD9U stacks 2 or 3 HD3U, ribbon or cassette	HD6U- / HD9U-	MDA	Stacked HD3U for large patch fields: up to 864 LC in 6U or 1,296 LC in 9U with 36-port cassettes (configure to order).
	HD1U enclosure 1U, 4 HD positions	HD1U- [L/R/A] -	Row · meet-me	Loose tube to 48F, ribbon LC to 96F, 144F LC quad build (configure to order). Row-end and carrier hand-off panels.
	HD Slim 1U Open 1U, patch only	HDS1U-E	Row · leaf rack	4 HD positions, modules ordered à la carte. Four MPO cassettes give 96 LC from 8 MTP trunks in one rack unit.
	HD adaptor plates LC, SC, MTP, Cat 6 RJ45	HDP-MTP-12 HDP-LC- · HDP-RJ45-6	MDA · Row	MTP plates (12 MTP per plate) pass MPO links straight through a patch field; LC and Cat 6 plates in the same enclosures.
	MPO pass-through cassette US Conec MTP rear adaptors	MPC-24-LC-A MPC-24-LC-U	MDA · Row	2 x MTP-12 rear to 12 LC duplex front. Type A, or Polarity Method B / Universal. Breaks trunks out to LC-duplex optics.
	OOFc splice cassette 24 or 36 LC	OOFc- [L/R] - [LC/LA] -24/36	MDA · Row	Splice and patch in one HD position, ribbon or loose tube. Builds the 432 LC HD3U and 1,296 LC HD9U.
	MPO trunk cables Plenum, US Conec MTP	MPOT-	MDA → rows	Custom length up to 288F, polarity Type A, B or C. Leaf-to-spine and MDA-to-row backbone.
	MPO jumpers Corning SMF-28 Ultra, US Conec MTP	MPO-	Row · MDA	Equipment cords from patch field to switch and node optics, all polarity types.
	Simplex / duplex jumpers Corning SMF-28 Ultra	SX- / DX-	All zones	LC and SC, UPC and APC, for in-band, storage, management and DCI hand-offs.
	Fiber pigtails SMF-28 Ultra (G.657.A1)	PT- [L/R] -	Entrance · MDA	Ribbon or loose tube pigtails for spliced enclosure builds; every assembly tested for end-face and geometry.
	Cat 6 copper TIA-568.2-D Category 6	C624- · C628-	Row	Jumpers (24 AWG and 28 AWG slim) for BMC and out-of-band management ports; RJ45 plates in any HD enclosure.

TYPICAL BUILDS

Three building blocks, entrance to row



BUILD 01 · ENTRANCE ROOM

One 6,912F OSP cable in, 24 plenum cables out

A high-count campus or DCI cable lands in a single wall-mount cabinet. The customer's 6,912F ribbon OSP cable, armored or dielectric, enters at the top, is spliced on 24 trays at 288F each, and leaves as 24 x 288F plenum cables through the right half of the top or bottom panel (your choice) toward the MDA.

FEC-6912	Fiber Entrance Cabinet, top OSP entry (standard), exit configuration 24 x 288F	1
FEC-UMK	Strut-mount kit (optional)	1
PTP-288-[L/R]-[A]-U-[L]F	Plenum preterm, 288F, single end terminated (End B spliced in the cabinet), or unterminated plenum cable	24

Result: **6,912 fibers** transitioned from OSP to plenum in one 44.5 x 21.5 x 13.25 in cabinet. For 48 x 144F exits, note that configuration on the FEC-6912 order.



BUILD 02 · MDA MAIN CROSS-CONNECT

1,728 LC in 21U with remote splicing

Two HD9U NT stacks put six HD3U ribbon enclosures of 288 LC each on 9U brackets, with pigtailed installed and no splice trays. Ribbon pigtailed drop through the rear knockouts to one HD3US below, one 288F tray per HD3U, so patching and splicing stay in separate panels. Repeat four times to terminate all 24 x 288F cables from Build 01.

HD9U-R-LC-864-NT	9U stack of three HD3U, 864 LC/UPC, ribbon pigtailed, no splice trays	2
HD3US	3U splice-only panel, 6 trays x 288F	1

Result: **1,728 LC ports** per group (2 x 9U + 3U), also orderable as one part number, HD21U-R-LC-1728. For the densest LC field, HD3U-C-LC-432 puts 432 LC in 3U with splice cassettes.



BUILD 03 · ROW / LEAF RACK

96 LC from eight MTP legs in 1U

A shallow open panel at the row end breaks MTP trunks out to LC-duplex ports for in-band, storage or management links. Two-leg trunks from the MDA plug into the cassette rear ports; DX- jumpers finish each link. GPU fabric links that stay MPO use HDP-MTP-12 plates and MPO-jumpers instead.

HDS1U-E	HD Slim 1U, 4 open HD positions	1
MPC-24-LC-A	2 x MTP-12 rear to 12 LC duplex front, Type A	4
MPOT-2X12-FF-A-SM-P-G0-030F	24F, 2 x MPO-12 each end, Type A, plenum, 30 ft	4

Result: **96 LC ports in 1 RU**, 8.66 in deep for shallow network racks.

WHY ONE OPTICS

Built to your drawing, tested before it ships

01 Built to order in Henderson, NV

Enclosures and cable assemblies are configured and built per order at our Henderson, Nevada facility, sized to your fiber counts and lengths rather than the nearest stock item, by a team with more than 30 years of experience in cable TV and data center fiber.

03 Configure-to-order part numbers

Part numbers encode fiber style, connector, polish, count, polarity and length, so the build on the drawing is the build on the purchase order.

Made in USA enclosures

HD1U, HD3U (including HD6U and HD9U stacks), HD3US, WMHD2X, WMHD6X and the Fiber Entrance Cabinet (FEC-6912).

02 Every assembly tested

Every assembly is tested before it ships; jumpers, pigtails and preterminated assemblies are tested for end-face cleanliness and end-face geometry. Test data and certificate of conformance available on request.

04 Components you can specify

Corning SMF-28 Ultra (G.657.A1) fiber in our jumpers, MPO jumpers and pigtails; Corning ALTOS cable on preterminated OSP and Corning plenum ribbon or loose tube cable on plenum preterms; US Conec MTP connectors on MPO jumpers, trunks and cassette adaptors.

Build America, Buy America (BABA)

BABA compliant, self-certified; compliance letter available on request. Applies to every product except fiber jumpers (simplex/duplex), MPO jumpers, pigtails and Cat 6 copper.

PLANNING CHECKLIST BY ZONE

ZONE	DECIDE EARLY	ONE OPTICS PARTS
Entrance room	OSP fiber count and cable type, top or bottom entry, exit cable count (24 x 288F or 48 x 144F), wall or strut mounting	FEC-6912 · FEC-UMK · PTP- · HD3US · HD1U
MDA	Ports per spine and core group, LC or MTP presentation, splice in the enclosure or remotely in an HD3US, rack units available	HD3U · HD6U · HD9U · HD3US · HDP-MTP-12 · MPC-24-LC- · OOF-
Rows / leaf	Rack depth, MPO or LC at the leaf, polarity method, trunk fiber count and length per row	HDS1U-E · HD1U · MPOT- · HDP-
Equipment	Connector and polish per optic, cord lengths per rack elevation, copper for BMC and out-of-band ports	MPO- · SX- / DX- · C624- / C628-

WHAT TO SEND FOR A QUOTE

- **Link list:** fiber count and connector at each end (LC, SC, MTP), polish (UPC / APC)
- **Polarity method** for every MPO channel (Type A, B or C)
- **Lengths** from your rack elevations and pathway routing
- **Jacket rating** and fiber type (singlemode standard; multimode on request)
- **Rack space** available per zone (1U, 3U, 6U, 9U, wall)

RELATED DATASHEETS

- Fiber Entrance Cabinet (FEC-6912) · HD3US · HD3U
- HD1U · HD Slim 1U · HD adaptor plates
- MPO pass-through cassette · OOF splice cassette
- MPO trunk cables · MPO jumpers · fiber jumpers
- Preterminated cables (OSP and plenum) · fiber pigtails
- Cat 6 jumpers and pull boxes

Specifications are subject to change. NVIDIA, HGX, DGX and NVLink are trademarks of NVIDIA Corporation; they are referenced only to describe the application.