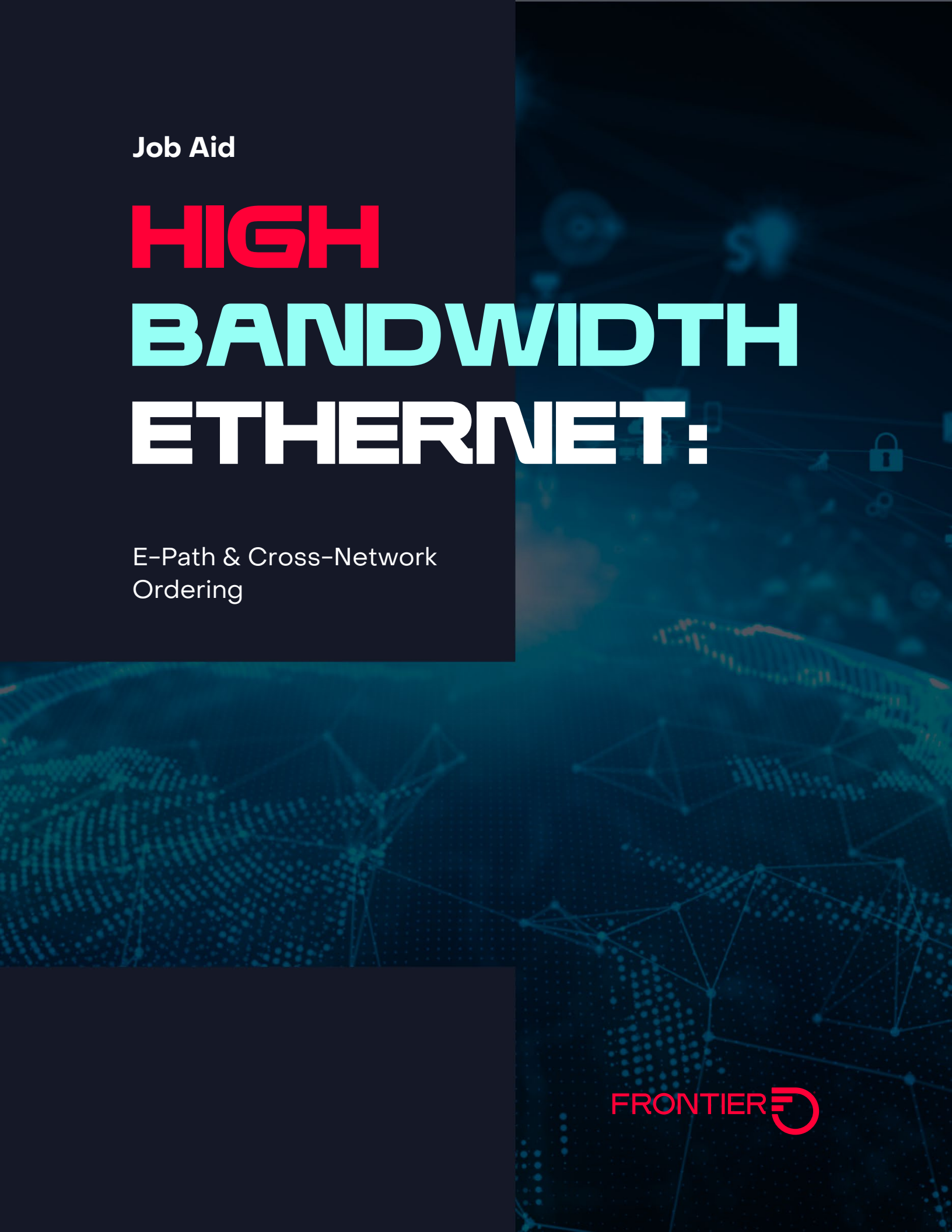
Job Aid

HIGH BANDWIDTH ETHERNET:

E-Path & Cross-Network Ordering



FRONTIER

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HISTORY AND PURPOSE

Effective June 30, 2025, Frontier will start offering E-Path services on bandwidths up to 100 Gbps, making it necessary to differentiate between Frontier's Legacy and HBE networks for two important reasons:

- An HBE External Network-to-Network Interface (E-NNI) is required to achieve higher bandwidths for E-Path circuits.
- If you wish to install a circuit between an E-NNI in an HBE wire center and a User Network Interface (UNI) in a Legacy wire center, Cross-Network becomes an option.

You must understand the differences between the Legacy and HBE networks and know the requirements for ordering each new configuration.

The purpose of this job aid is to:

- Define the Cross-Network configuration and order placement requirements
- Outline the criteria for ordering an HBE E-Path circuit
- Provide a brief FAQ for quick reference

OVERVIEW: LEGACY VS. HBE NETWORKS & CROSS-NETWORK

The most complicated aspect of Cross-Network, and HBE in general, is articulating the differences between the Legacy and HBE networks, and the benefits of a cross-network configuration.

The below overview provides a high-level introduction. Each concept will be broken down further in subsequent sections of this job aid.

Legacy Network

- **What it is:** Frontier's existing copper and fiber network.
- **Bandwidth:** Supports up to 1 Gbps (or 2 Gbps in some areas).
- **Availability:** Most circuits are currently engineered on this network.
- **Technology:** Uses older technology.

High Bandwidth Ethernet (HBE) Network

- **What it is:** Frontier's new, enhanced fiber network.
- **Bandwidth:** Supports Ethernet Virtual Connection (EVC) bandwidths up to 25 Gbps where available.

    - 50 Gbps or 100 Gbps available via Individual Case Basis (ICB) contracts.
- **Purpose:** Designed for our customers with high bandwidth needs and modern infrastructure.

When to Use an HBE E-NNI

- Available in wire centers that are HBE-enabled.
- Supports EVC bandwidths up to 25 Gbps, but required for bandwidths 5 Gbps and greater.
- Cross-Network configurations.
- If you require an E-NNI in a Wire Center where Legacy equipment is unavailable (max speed = 0), but HBE equipment is available (max speed = 10 Gbps or 25 Gbps) Ethernet Enabled Wire Center List

Key Differences

Feature	Legacy Network	HBE Network
Max Bandwidth	Up to 1-2 Gbps	Up to 25 Gbps (50-100 Gbps via ICB)
Compatibility	Not compatible with HBE	Not compatible with Legacy
Availability	Widely available	Limited to upgraded wire centers

What is Cross-Network and How Does it Work?

Cross-Network is a solution that allows a UNI in a Legacy Wire Center (WC) with an HBE Network Interface Device (NID) to connect to an HBE E-NNI in an HBE WC using an Internal Network-to-Network (I-NNI) circuit.

- A UNI on the Legacy network connects to an E-NNI on the HBE network.
- Requires an HBE NID at the UNI (end-user location).

Cross-Network Limitations

1. **UNI must be 1 Gbps** - EVC bandwidth must be between 5 Mbps and 1 Gbps.
2. **New orders only** – no repoints or rehomes of existing services.
3. **Limited availability** – check the XNET_INNI column of the Ethernet Enabled Wire Center List for eligibility.

How to Check Availability

- Refer to the Ethernet Enabled Wire Center List:
  - **"Yes"** = Cross-Network available
  - **"Extended Int."** = Available within 45 days
  - **"No"** = Not available

HBE E-PATH

Effective June 30, 2025, Bandwidths of 2 Gbps, 5 Gbps, 10 Gbps, 25 Gbps, 50 Gbps, and 100 Gbps (the latter two, as ICBs) are available. To request an EVC at any of these bandwidths, **you must first have an HBE E-NNI installed**.

Where HBE is available, with few exceptions, it will coexist alongside the Legacy network within the same service wire center; however, they operate independently from one another. As a result, Frontier has adopted two new Service Product Enhancement Codes (SPEC) to quickly and easily identify when you are requesting an E-NNI on the HBE network. The HBE SPEC is only required for Wireline E-NNIs.

SPEC Codes

Code	Description
EPATHN	Continue to use for an E-NNI on the Legacy network
EPATHCP	Continue to use for an E-NNI on the Legacy network in a Core Pop
EPATHHN	**NEW SPEC** code for an E-NNI on the HBE network
EPATHHC	**NEW SPEC** code for an E-NNI on the HBE network in a Core Pop

How to Know Where HBE and Cross-Network Are Available

The Ethernet Enabled Wire Center List is the primary source – and currently the only source available externally – for you to utilize in determining if your wire center is HBE eligible and Cross-Network compatible. Though you may not be familiar with the Ethernet Enabled Wire Center List, our staff can assist you in finding and understanding how to use it.

To accommodate HBE and Cross-Network ordering, we have updated the Ethernet Enabled WC List as follows:

1. On the *E_NNI_Interconnection_Locations* tab, a column labeled **100G ENNI** is now available
2. On the *Ethernet_Enabled_SWC* tab:

a. The **SPEED** column has been removed and replaced with two new columns:
   i. **HBE Speed**: containing the max bandwidth available for HBE
   ii. **Legacy Speed**: containing the max bandwidth available for Legacy
   iii. Note: Where a column is blank, the respective network/service is unavailable.
b. A new column **EPath X-Network (Cross Network)**, populated with a Yes, No, or Extended Int. (for definitions, click here)

Before an ASR is submitted for an EVC bandwidth of 2 Gbps or greater, you should follow these steps to confirm availability:

1. Query Connectbase, Masterstream, Building Location List or VFO to obtain serviceability for the desired EVC bandwidth and copy the SWC CLLI.
2. Query the SWC CLLI on the Ethernet Enabled WC List, reviewing the "HBE Speed" column for 10G or 25G – both indicate HBE available – ensuring the max speed listed will accommodate the needed EVC bandwidth for the speed available, and the "Legacy Speed" column for the speed available.

Assuming HBE is available, you will be required to submit your ASR for an E-NNI with one difference – you must use one of the HBE SPEC codes listed above.

CROSS-NETWORK (XNET)

Cross-Network (XNET) Overview

XNET enables an EVC between a UNI on the Legacy network and either an E-NNI (standard E-Path) or another UNI on the HBE network (P2P).

Ordering Requirements

To request XNET, you must meet the following basic requirements:

1. You must first have an HBE E-NNI installed or have received an FOC on one in progress (SPEC = EPATHHN, or SPEC = EPATHHC for Core POP)
2. Once FOC for HBE NNI has been received, the combination UNI/EVC may be submitted
   a. The only acceptable UNI speed is 1 Gbps
   b. The EVC bandwidth is between 5 Mbps and 1 Gbps
3. The ASR is for new service only – note that repoints are not allowed for XNET.

FAQS

What is the Legacy network?
The Legacy network is Frontier's existing copper and fiber network offering bandwidth up to 1 Gbps (2 Gbps in 564 WCs), where most circuits are currently engineered.

What is the High Bandwidth Ethernet (HBE) network?
The HBE network is Frontier's new, enhanced fiber network. You may request up to 25 Gbps where available and may request 50 Gbps or 100 Gbps via an Individual Case Basis (ICB) contract where available.

What is the primary difference between the Legacy and HBE networks?
The equipment! HBE is available in a wire center where an Ethernet Transport Layer Egress Tunnel Router ETR (Ethernet switch) has been equipped.

Are the Legacy and HBE networks compatible?
No, the two networks are not compatible.

What is Cross-Network?
Cross-Network allows a UNI on the Legacy network to connect to an E-NNI on the HBE network. This is accomplished via an Internal Network to Network Interface (I-NNI - an internal circuit established by Frontier) in an HBE wire center connecting the HBE equipment to the Legacy equipment and requires a specific NID on the UNI at the End User location.

What limitations, if any, exist for Cross-Network?
1) The UNI *must* be 1 Gbps, and the EVC bandwidth can range from 5 Mbps to 1 Gbps.
2) Available for new orders only - no repoints or rehomes of existing service.
3) Limited availability: Refer to the Ethernet Enabled Wire Center List for wire centers where Cross-Network is available.

Do I have to have both a Legacy and HBE E-NNI?
No. Your needs will dictate where an HBE E-NNI must be installed. Work with your Sales Engineer to discuss your network needs.

When must I have an HBE E-NNI?
When ordering an EVC bandwidth of 5 Gbps or greater, or where the wire center does not currently support 2 Gbps on the Legacy network.

How will I know where HBE Cross-Network is available?
The Ethernet Enabled Wire Center List has a new column labeled “XNET” with a “Yes”, “No”, or “Extended Int.” option. This list is updated once a month. A wire center marked “yes” indicates Cross Network is available; a wire center marked “Extended Int.” indicates the wire center will be Cross-Network compatible within 45 days after order issuance; and “no” means Cross-Network is unavailable.

Can I repoint existing circuits to the new HBE network?
No, change activity EVC repoints are not allowed. Changing networks requires a new UNI install and disconnect and recommends a combination UNI and EVC install RPOND to a combination UNI and EVC disconnect. To have any traffic on the HBE network, the customer must first stand up an HBE NNI.

How do I request an HBE E-NNI?
1) Submit an ASR with Service Product Enhancement Code (SPEC) code of E-PATHHN for all wire centers not in a Core Pop, and E-PATHHC for Core Pop wire centers. Once the Firm Order Confirmation (FOC) is sent for the E-NNI, you will have to submit your UNI-combination ASR.
2) Refer to the Ethernet Enabled Wire Center List for available speeds.
3) Refer to the “E-Path Core POP E-NNI Order Processing” and the “E-Path Stand Alone E-NNI ACT D, N” job-aids available here: https://wholesale.frontier.com/resources/access-services/ethernet-ordering/ethernet-order-samples.html.

How do I order Cross-Network, or what will be different on my ASR?
To order Cross-Network, you must first have an HBE E-NNI in service at the connecting wire center. If you already have an HBE E-NNI, you may submit your ASR business-as-usual.

Is Cross-Network available for Point-to-Point configurations?
Yes. A Point-to-Point scenario would involve one UNI in an HBE wire center that is eligible for Cross-Network, and the second UNI in the Legacy network. There is no change to the ordering process.

How do I order an HBE UNI?

After obtaining an HBE E-NNI or receiving the HBE E-NNI FOC, ensure that your Wire Center is on the Ethernet Enabled Wire Center List and the max bandwidth is 10G or greater, then submit the combination UNI/EVC ASR or Point-to-Point UNIs.

Are the new HBE E-NNI SPEC codes required for both WireLINE and WireLESS?

No. These SPEC Codes are only valid on a WireLINE order.

REVISION HISTORY

Date	Issue	Description of Changes
6/30/2025	Original Issue	

