

# Nasdaq TotalView-ITCH FPGA:

## Frequently Asked Questions

### GENERAL

#### What is FPGA?

A field-programmable gate array (FPGA) is an integrated circuit designed to run user specified, high performance business applications and to provide a high degree of parallelism allowing for consistent, deterministic behavior.

#### What are the benefits to the TotalView-ITCH FPGA feed?

- TotalView-ITCH FPGA is more efficient at handling traffic bursts from the Nasdaq trading system than the traditional software-based feed handlers.
- TotalView-ITCH FPGA provides one of the highest levels of determinism to the customer offered by Nasdaq.
- TotalView-ITCH FPGA uses the current ITCH 5.0 messaging standard and MoldUDP64 protocol suite so it can be easily deployed in trading system and market data platforms.

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### TECHNICAL

#### Why is TotalView-ITCH FPGA more efficient than traditional software-based feed handlers?

TotalView-ITCH FPGA disseminates data in an unshaped traffic pattern that reflects true market volumes at all points during the trading day. Traditional software-based feed handlers are subject to certain buffering and queuing effects during peak market conditions. While many firms rely on Nasdaq to control and shape its outbound data rates during these periods, some firms would prefer a more deterministic approach to data delivery that is delivered with FPGA technology.

#### Where can I find the Nasdaq TotalView-ITCH FPGA specification document?

[Click here](#) to view the Nasdaq TotalView-ITCH FPGA specification document.

#### What protocol options are available for the TotalView-ITCH FPGA product?

The TotalView-ITCH FPGA product is available via [MoldUDP64](#) only.

#### What are the IP addresses for the TotalView-ITCH FPGA feed?

The UDP/IP address for TotalView-ITCH FPGA product is as follows:

SITE	CHANNEL/PURPOSE	GROUP	PORT	SOURCE IP ADDRESS
New York Metro	Nasdaq TotalView-ITCH FPGA - Broadcast Channel	233.54.12.101	26400	206.200.127.129

### What is the network connectivity requirement for the TotalView-ITCH FPGA data feed?

Nasdaq requires that direct data feed subscribers have a 10 Gb network or a 40 Gb network [connection](#) at the primary data center (Carteret) to access the TotalView-ITCH FPGA service.

### What is the recommended bandwidth allocation for the TotalView-ITCH FPGA service?

Nasdaq does not have a specific bandwidth recommendation for the TotalView-ITCH FPGA product. Nasdaq would simply advise TotalView-ITCH FPGA firms to be prepared to handle milli-second data bursts of up to 2,000 messages.

### Given that the TotalView-ITCH FPGA feed is only offered at the primary data center, what should I do in case of an outage?

For fault tolerance and disaster recovery reasons, Nasdaq advises all TotalView-ITCH FPGA clients to subscribe to the standard software TotalView-ITCH 5.0 data channels at both the New York Metro and Chicago data centers. Nasdaq also recommends customers to arbitrate between software and hardware messages. Arbitration should process the message with the higher sequence on the feed handler and discard the messages with lower sequence number, which ensures that only the latest market data is processed by the feed handler.

### As a TotalView-ITCH FPGA client, how should I look to fill data gaps?

Nasdaq ensures that the message sequencing is the same for all versions of the TotalView-ITCH 5.0 service, so firms may use the following IP addresses for packet re-requests at the primary data center:

SITE	CHANNEL/PURPOSE	GROUP	PORT	SOURCE IP ADDRESS
New York Metro	NASDAQ TotalView-ITCH 5.0 - 10 Gb Network Re-Requests A	N/A	18170	206.200.127.37
New York Metro	NASDAQ TotalView-ITCH 5.0 - 10 Gb Network Re-Requests B	N/A	18170	206.200.127.220

To obtain a state-of-the-book refresh, TotalView-ITCH FPGA clients should also subscribe to the [Nasdaq GLIMPSE 5.0](#) service. While there is no additional charge for this add-on service, Nasdaq TotalView-ITCH FPGA subscribers must complete the [Data Feed Request Form](#) to obtain access to Nasdaq GLIMPSE 5.0.

### Will the TotalView-ITCH FPGA packet size be similar to the standard TotalView-ITCH product?

No. For the TotalView-ITCH FPGA product, packet size varies by channel. Given the nature of the TotalView-ITCH FPGA product, the packet sizes may be significantly larger during peak market periods. Nasdaq advises all TotalView-ITCH FPGA clients to be prepared to handle packets up to 1,500 bytes in length.

## Administrative

### Is Nasdaq planning to offer the FPGA feed in a multi-channel (multi-thread) option?

No. For the initial implementation, Nasdaq will offer only a single channel version of the Nasdaq TotalView-ITCH FPGA data feed.

**What are some of Nasdaq's recommended FPGA best practices?**

Messages produced by FPGA and software versions of ITCH are identical, and arbitration between FPGA and software feeds in the feed handler is recommended to provide the best experience across feeds as well as to enhance the resiliency of customer market data reception.

**When does FPGA ITCH design generate Mold64 UDP heartbeat messages?**

FPGA ITCH design generates Mold64 UDP heartbeat messages every second when the FPGA is up to date and the ITCH state machine generates no ITCH messages, indicating the FPGA ITCH is alive and processing.

**How do I subscribe to the Nasdaq TotalView-ITCH FPGA product?**

If your firm is a current TotalView-ITCH subscriber upgrading to the FPGA product, you only need to complete the [Data Feed Request Form](#). No additional forms or agreements are required.

If your firm is not currently processing the Nasdaq TotalView-ITCH product, you need to complete the following agreements:

- [Nasdaq Global Data Agreement](#) - Required only if your firm is not yet party to the agreement.
- [System Application](#) - Required of all first time TotalView-ITCH clients.

**Do I need submit a Data Feed Request Form if I am only looking to test the TotalView-ITCH FPGA product?**

Yes, every firm must complete the Data Feed Request Form to receive access to the TotalView-ITCH FPGA product.

**If I only use TotalView-ITCH FPGA for Non-Display purposes, do I need to complete all the agreements?**

Yes, all firms, regardless of intended use, must execute the proper forms and agreements with Nasdaq prior to initiation of service. Even non-display requires a license to utilize the information. Please contact your [Nasdaq Account Manager](#) if you have questions on the non-display policy and the possible impacts of using FPGA in non-display.

**Whom should I contact with Nasdaq pricing or data policy questions?**

Please contact your [Nasdaq Account Manager](#) at +1 301 978 5307.