

G2M Research NVMe Market Sizing Report Abstract

Report Purpose

The purpose of the G2M Research NVMe Market Forecast and Vendor Report is to provide those who participate in the marketplace NVM Express® (NVMe™) and NVMe over Fabric (NVMe-oF) systems, devices, and software with guidance on the size of these markets, their expected growth rates, and the drivers/hurdles for the market growth over a five-year window. This report is focused on providing usable market data for the following portions of the enterprise NVMe ecosystem:

- NVMe enabled servers for applications
- NVMe/NVMe-oF storage appliances (servers used primarily to provide storage services)
- NVMe/NVMe-oF storage arrays (dedicated storage systems utilizing NVMe/NVMe-oF)
- NVMe/NVMe-oF “just a bunch of flash” (JBOF) enclosures
- NVMe solid-state drives (SSDs) for all form factors
- NVMe-oF adapters (both “standard” adapters and “accelerated/offload/smart” adapters)

Our report also provides qualitative data on NVMe Scale-Out Flash Storage (SOFS) software that is utilized in NVMe/NVMe-oF storage appliances and application servers. The target audience for this report includes: data center architects and managers; NVMe/NVMe-oF product and ecosystem vendors; NVMe OEMs, NEPs and ODMs; business unit/executive management; venture capitalists (VCs), angel investors, and financial analyst and private equity (PE) investors.

G2M Research NVMe Market Report Overview

The current footprint for NVMe-enabled systems and devices can be expected grow exponentially to be a multi-billion-dollar market, as data centers, service providers and telecom equipment providers and carriers start to utilize NVMe-capable enabled infrastructure platforms and NVMe-oF networks. The G2M Research™ NVMe Ecosystem and Market Forecast Report captures relevant data from these new markets. The report consists of following sections:

- Definitions for NVMe/NVMe-oF and the component market products
- NVMe market forecast assumptions and growth drivers/inhibitors
- Five-year forecasts for enterprise NVMe servers, NVMe/NVMe-oF storage appliances, NVMe/NVMe-oF all-flash arrays (AFAs), NVMe solid-state drives (SSDs), and NVMe-oF adapters (including both standard adapters and accelerated/offloaded/smart adapters)
- The G2M Research forecasting methodology

NVMe Market Forecast & Vendor Report Methodology Overview

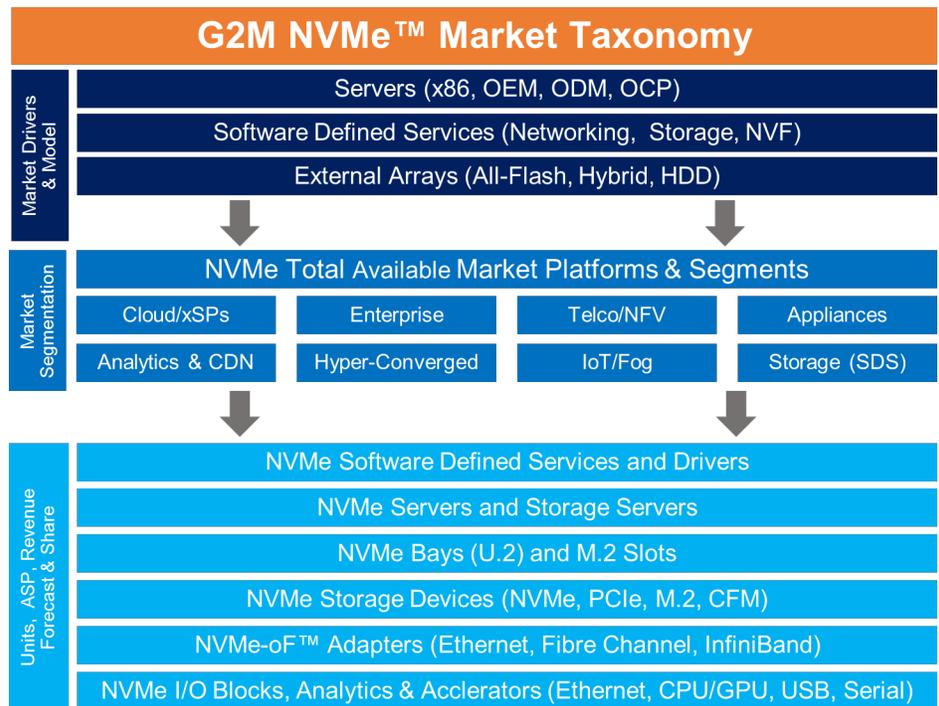
One of the most frustrating aspects of utilizing market forecast data are the disconnects, hidden assumptions, and “less than transparent” taxonomies utilized by different market analysts. These place the user of the data (whether they are product managers in a large company, executives in a startup, or investors) with the unenviable task of having to reconcile the different forecasts and methodologies (difficult at best), or “bracketing” the forecast by choosing the lowest and highest as the brackets, without understanding what is driving the differences in the forecasts.

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The goal of G2M Research is to provide forecasts that are consistent across the entire NVMe/NVMe-oF ecosystem, and which provide rationale for their divergence from (or convergence with) the results provided by other market research firms. For the NVMe Market Report, our approach to market sizing is as follows (all of the data from these intermediate steps are provided in the G2M Research NVMe Market Report):

1. Size the current market for platforms that can be “hosts” for NVMe devices. This includes three types of systems: servers; storage appliances (i.e., servers that are dedicated to running software-defined storage packages); and all-flash storage arrays. We utilized publicly available data from Gartner, IDC, and other sources. We also interview vendors in this market to “shape” the combination of this data into a baseline, and to forecast market growth. For this report, we specifically do not include servers, storage appliances, or arrays utilized by “hyperscale/cloud” providers (Amazon AWS, Google, Microsoft Azure, and the BATs) because of the secretiveness of their architectures.

2. Size the availability of NVMe “sockets” in host platforms. G2M Research the performs an in-depth analysis of the host platforms to see which ones provide “bays” for NVMe devices. These platforms are broken down into either “NVMe Bays” (2.5” or 3.5” bays with U.2 connectors), or M.2 sockets. While this leaves out PCIe card form factor “sockets”, their inclusion would result in the inclusion of **all** servers, since all servers have PCIe slots. Once we determine the number of platforms with NVMe “slots”, we utilize data on the number of NVMe bays



and M.2 sockets per host platform to come up with the number of NVMe bays available. Finally, we utilize historical adoption trend rates for similar technologies such as PCI Express (PCIe), plus vendor interviews, to determine the likely growth rate in the number of bays per platform, and the growth in adoption rate for platforms with NVMe bays.

3. Size the market for various NVMe SSDs. In a similar manner to which we size the number of available NVMe platforms, we size the market for SSDs utilizing publicly-available data from Gartner, IDC, and other sources. We then examined the specific product offerings from the device vendors to determine what the likely percentage NVMe SSDs were in the overall SSD market, again augmented by interviews with NVMe device vendors. Finally, we modulated the predicted growth rates from the publicly available sources with the vendor interview data to

Market Forecast & Vendor Report Abstract

derive our growth rates. These were applied to the previous data to determine final forecasts for NVMe U.2, EDSFF, M.2, and PCIe SSDs.

4. Size the market for NVMe-oF adapters. G2M Research also measures the size of the market for NVMe over Fabric (NVMe-oF) adapters. Since all many modern Ethernet adapters, all Gen5+ and Gen6 Fibre Channel (FC), and all late-model InfiniBand (IB) adapters can support NVMe-oF, G2M focuses on forecasting NVMe-oF adapters that actually connect (or will connect) to NVMe-oF networks. We break this market down based on initiator devices (both in application servers and in the back-end of storage appliances and/or AFAs) and target devices (both in the front end of storage appliances and/or AFAs and in JBOFs). We further break these markets down into “standard” (unaccelerated) adapters and into adapters utilizing SoCs or FPGAs (also known as “accelerated”, “offloaded”, or “smart” adapters).
5. Ecosystem Resolution Process. While it may seem intuitive that all of these forecasts should be interrelated, it is our experience that this is not the case for a large number of commercially-available forecasts. In fact, most of these forecasts look at each market in isolation. This is where the value of the G2M Research Market Taxonomy and its “cause and effect” mechanisms come in. The result is a set of forecasts that are internally consistent.
6. Top Takeaways and Final Vendor Validation. While forecast data in and of itself is useful, G2M Research also compiles a list of key takeaways that we highlight in our reports. We then take these back to our interview vendors to validate them (and hence the data that they are based on). The result is a report that provides detailed data AND expected outcomes and doesn't force our report customers to become analysts.



G2M Research Market Sizing Report Deliverables

The G2M Research Market Sizing Report is delivered in both Microsoft Word and Excel format.

G2M Research – Analysts with “Real-World” Experience

G2M research is staffed by industry professionals who been on every side of this business: vendors, industry analysts, OEMs, and channel/IT end user. Our goal is to leverage best in class industry data, vendor expertise, OEM perspectives and real-world customer experiences to build a “multi-sourced” market analysis model. We will do this through our “G2M Top Down Model,” reference points from partner analyst, direct briefings/interviews with vendors, OEMs, channel partner. Additionally, we will conduct primary market research and surveys with end users in key segments. Please contact us at info@g2mcommunications.com to subscribe and/or schedule a briefing.

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