



# Validated Designs for HPC Financial Services

Tap into the power of HPC to speed financial services workloads

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# 50%

of FSIs are continuing to invest in HPC.<sup>1</sup>

# 53%

of FSIs utilize accelerated computing for HPC.<sup>1</sup>

## Use data to drive revenue growth and profitability

There's no question that advances in technology dramatically reshape the financial services industry — and financial services institutions (FSIs). Established commercial banks, investment firms and insurance providers, as well as financial technology (fintech) disruptors, seek to capitalize on advanced technologies to improve investment returns and attract and retain more customers in a competitive global marketplace.

The competitive landscape for FSIs is shaped by data. While FSIs understand the value of data, many currently leave the value of much of their data on the table, because siloed legacy systems can't provide the ability to react in real time based on insights locked in historical and real-time data.

High performance computing (HPC) is the key to unlocking the value of data for FSIs. HPC already provides first mover advantages for FSIs using the technology to speed time to results for data-intensive risk assessments, complex pricing decisions, advanced fraud detection and smarter high-frequency trading.

Dell Technologies helps expand the capabilities of FSIs to compete, with scalable, flexible solutions designed to help you make better decisions faster than ever. Dell Validated Designs for HPC can help you fast-track projects and success, speed time to results with confidence and savings, and maximize performance, efficiency and flexibility to capitalize on the promise of HPC for data-intensive workloads.

## Dell Technologies has what you need

### Expertise and guidance

HPC is evolving quickly, so your team may not have the resources to design, deploy and manage solution stacks optimized for financial services applications and workloads. While HPC might seem like the latest IT trend, Dell Technologies has been a leader in the advanced computing space for over a decade, with proven products, solutions and expertise. Dell Technologies has a team of experts dedicated to staying on the cutting edge, testing new technologies and tuning solutions to your applications to help you keep pace with this constantly evolving landscape.

### Dell Validated Designs for HPC Financial Services

For many FSIs, HPC is — or is becoming — an important source of competitive advantage. An optimized HPC solution delivers the compute, throughput and capacity needed to manage the rapid data growth and increased workload demands presented by advanced analytics and other financial workloads. Validated Designs are workload-optimized, rack-level systems with servers, software, networking, storage and services to scale faster with the confidence of an engineering-tested solution while enabling business without boundaries.

### Solutions customized for your environment

Dell Technologies uniquely provides an extensive portfolio of technologies to deliver the advanced computing solutions that underpin successful HPC implementations. With years of experience and an ecosystem of curated technology and service partners, innovative Dell solutions, workstations, servers, networking, storage and services reduce complexity and enable you to capitalize on the promise of HPC.

<sup>1</sup> NVIDIA survey report, [State of AI in Financial Services](#), January 2022.

“With Dell, we’re not just getting some servers. We’re getting the entire spectrum of services and support that we need to succeed.”

— Greg Jacobs,  
Engineering Manager of  
Infrastructure, OTTO Motors<sup>2</sup>

## HPC use cases for financial services

How does your organization plan to leverage HPC? Dell Technologies has the proven expertise in building, deploying and supporting workload-optimized HPC solutions for the financial services industry in the following use cases:

### Fraud detection and prevention

HPC can run sophisticated analytics designed to detect suspicious behavior and anomalies in real time, sifting through patterns in the data to identify suspicious activity and serve customers better. For example, credit card companies can use more accurate fraud identification to let legitimate charges go through while flagging fraudulent transactions for investigation.

### High-frequency trading

Supercharge high-frequency trading (HFT) with HPC providing the power to execute trades faster, running algorithms designed to identify patterns and trends in data — including sentiment analysis, drug approvals, election outcomes and weather forecasts — to make predictions about the direction and volatility of a stock price and bid accordingly.

### Pricing

Set optimal pricing for a variety of financial products with HPC enabling thousands of simulations to calibrate pricing to market conditions in real time. HPC can power sophisticated, data-driven applications used to predict and prepare for market moves or evaluate and price risk on an individual basis, so you can respond with accurate, targeted offers that win more business and deliver better returns.

### Risk assessments

HPC enables evaluating and testing millions of hypothetical scenarios for faster risk recalculations in response to changing market conditions. Monte Carlo simulations excel with the power of HPC giving them the ability to simulate huge numbers of parallel market scenarios over large portfolios to better predict changing market conditions for better, faster risk assessments.

## Overcome challenges to adopting or expanding HPC

> Challenge: “Deploying HPC resources takes too long and doesn’t always provide the results we expected.”

Properly deploying and tuning an HPC cluster can be a specialized, error-prone task that requires a significant investment of time and resources. For organizations that are relatively new to HPC, hiring specialists can be a challenge because shortages make them hard to find and expensive to add to the payroll. In both cases, the process for selecting, procuring and deploying HPC clusters can take weeks or months. If the system isn’t configured properly for the target workloads, performance may not be as expected. And HPC is a rapidly evolving discipline, so it can be hard to keep up with the latest advancements.

## Advancing HPC: Leverage expertise to fast-track projects and success

Dell Technologies has the expertise, innovation and strategic partnerships to help you advance the state of the art for HPC, from the workgroup to the TOP500. Our dedicated HPC experts are active members in the HPC community, helping us stay at the head of the curve for HPC innovation. We invite customers to collaborate with our worldwide Customer Solution Centers, Dell Technologies HPC & AI Innovation Lab — dedicated to cutting-edge research and development (R&D) — and with one of our many global Dell Technologies HPC & AI Centers of Excellence. Our experts will work with you to design, test and tune, and benchmark solutions, with a deep understanding of optimal system design to help enhance performance for your financial services workloads. And we keep an eye on the future, obtaining 2,035 patents last year, for a total of 26,189 patents.<sup>3</sup>

<sup>2</sup> Dell Technologies case study, [OTTO Motors®](#), accessed September 2022.

<sup>3</sup> Dell Technologies, [Key Facts](#), accessed October 2022.

“Our partnership with Dell Technologies helped Trintech grow revenue by 300%, triple the number of SaaS customers supported on this infrastructure and increased operational efficiencies by more than 350%.”

— Matt Bertram,  
VP of Technology,  
Trintech<sup>7</sup>

> Challenge: “We want to get started with or expand HPC, but we don’t have the in-house resources.”

Organizations across a wide spectrum of sizes and industries are starting to explore HPC — expanding HPC’s impact well beyond typical research, life sciences and manufacturing applications. But the complexity of designing, deploying and managing an HPC system can be daunting, even for large global FSIs.

### Democratizing HPC: Speed time to results with confidence and savings

Dell Technologies is working to democratize access to HPC, enabling FSIs to accelerate adoption with Validated Designs for HPC. These domain-specific configurations are designed, validated and tuned by HPC engineers and workload/application experts. The result is industry-standard, modular IT building blocks that offer simplified design, configuration and ordering in hours instead of weeks, with single point of contact available for services. Validated Designs for HPC have been shown to provide 15X acceleration in value recognition and 18–20% faster deployment.<sup>4</sup>

> Challenge: “We need to show value from our HPC investments.”

FSIs need to understand how IT drives value. Total cost of ownership (TCO) is an important element of the return on investment (ROI) equation. Keeping TCO low starts with cost-optimized solutions for lower capital expense. Management simplicity can help keep operational expenses lower over the life of the solution. And systems that are ready for hybrid cloud help future-proof investments. In addition, a single point of contact for support can streamline ordering and help avoid costly downtime.

### Optimizing HPC: Maximize performance, efficiency and flexibility

Our robust portfolio of products and services is optimized for HPC, providing performance and efficiency from a company invested in your future. Dell Technologies is proud to power 17 of the TOP500<sup>®</sup> supercomputers<sup>5</sup> and provide solutions for a range of HPC needs. Our price-performance-optimized portfolio includes workstations, servers, networking and storage. Management and orchestration capabilities maximize utilization, including hybrid cloud, with innovations that make it possible to run thousands of simulations in test.<sup>2</sup> Our configurations provide 1.23X better space efficiency.<sup>6</sup> Plus you can opt for a wide selection of services: consulting, education, deployment, managed services, support and financing, with 35,000 full-time service experts available to assist you worldwide.<sup>3</sup>

<sup>4</sup> Dell Technologies, [Accelerate Discovery and Innovation with HPC](#), accessed September 2022.

<sup>5</sup> TOP500, [The List](#), November 2022.

<sup>6</sup> STAC-A2.β2.HPORTFOLIO.SPACE\_EFF. Source: [STAC Report](#), CUDA 11.6 with 4x NVIDIA A100 SXM4 40GB GPUs in a Dell PowerEdge XE8545 Server with Red Hat Enterprise Linux 8.3, October 2022.

<sup>7</sup> Dell Technologies case study, [Digital transformation enables 3X customer and revenue growth](#), March 2021.

### Customer success stories

Dell Technologies advanced computing solutions help our customer innovate and thrive.

#### McLaren® Racing

**100,000**

data points collected during a single trial or race

**20 minutes**

between engineering changes, enabled by rapid prototyping and digital twins

**Weeks**

to deploy an HPC system, compared to six to nine months

Read the customer story: [Innovation doesn't stop at the finish line.](#)

#### Medacis®

**5 minutes**

instead of 24 hours for delivering analytics results

**Millions of dollars**

in savings due to upholding 99.99% uptime SLA agreements

**13% savings**

using Dell PowerEdge servers

Read the case study: [Medacis advances healthcare analytics.](#)

#### Duos Technologies®

**120:1**

efficiency gains

**8 minutes**

to visualize an entire freight train

**\$3,000 savings**

per instance

Read the case study: [Automated railcar inspections increase security and revenue.](#)

Explore more [customer stories.](#)

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“We can perform our aerodynamics studies using computational fluid dynamics faster with our new Dell Technologies HPC system compared to our previous setup.”

— Edward Green, Principal Digital Architect, McLaren Racing<sup>8</sup>

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<sup>8</sup> Dell Technologies customer story, [Innovation doesn't stop at the finish line](#), accessed September 2022.



## Validated Designs for HPC Financial Services

### Risk Assessment

Assess risks faster and with greater efficiency using HPC for Monte Carlo simulations

To thrive in a highly competitive global marketplace, you need to capitalize on technologies designed to improve investment returns and attract and retain more customers. An important part of that equation involves using sophisticated simulation algorithms to analyze large data sets from multiple sources to make fast, accurate calculations that help you match credit offers to risk levels. The Validated Design for HPC - Risk Assessment runs data intensive Monte Carlo simulations on powerful HPC systems that include NVIDIA GPU-accelerated Dell PowerEdge servers paired with high-performance storage, optimized to accelerate Monte Carlo simulation results. The solution also supports NVIDIA HPC SDK.

Configuration options			
Dell PowerEdge servers	Storage	Networking	Software
R750xa, R7525 and XE8545 with NVIDIA® A100 GPUs	Dell PowerScale All-Flash F900 Or Dell Validated Designs for HPC BeeGFS® Storage	• NVIDIA Networking	• Red Hat® Enterprise Linux® • NVIDIA Bright Cluster Manager®

### Record-Breaking Performance in STAC A2 Benchmark Tests

The Securities Technology Analysis Center (STAC) provides technology research and testing tools based on community-source standards. The STAC-A2 Benchmark suite is the industry standard for testing technology stacks used for compute-intensive analytics workloads involved in pricing and risk management. The Dell Validated Design for HPC - Risk Assessment set records for space efficiency and cold time calculations in financial services industry STAC-A2 benchmark testing. Cold time calculations are especially important to firms with compute grids and clusters where the compute gets used for many different tasks. They want systems that allow them to set up a new task and compute quickly. The value of the efficiency benchmark is the space and power savings from using 4 GPUs instead of 8 GPUs.

#### 1.23X better space efficiency

Record-setting space efficiency with 1.23X more calculations per cubic inch of data center space<sup>9</sup>

#### 2.25X faster

Record-setting cold time calculations for baseline problem sizes<sup>9</sup>

#### 1.15X faster

Record-setting cold time calculations for large-scale problem sizes<sup>10</sup>

[Read the report.](#)

<sup>9</sup> STAC-A2.β2.GREEKS.TIME.COLD. Source: [STAC Report](#). CUDA 11.6 with 4x NVIDIA A100 SXM4 40GB GPUs in a Dell PowerEdge XE8545 Server with Red Hat Enterprise Linux 8.3, October 2022.

<sup>10</sup> STAC-A2.β2.GREEKS.10-100k-1260TIME.COLD. Source: [STAC Report](#). CUDA 11.6 with 4x NVIDIA A100 SXM4 40GB GPUs in a Dell PowerEdge XE8545 Server with Red Hat Enterprise Linux 8.3, October 2022.

### Solution highlights

**Precision workstations** — Run high-demand, industry-specific applications at peak performance to help save time and control costs. Dell Precision workstations, together with accelerators, deliver breakthrough performance for parallel computing applications.

**PowerEdge servers** — Dell PowerEdge servers are engineered to deliver unmatched performance and versatile configurations to meet the demands of HPC workloads. Flash storage, the latest processors, greater memory bandwidth and flexible local storage make Dell PowerEdge servers a foundational choice for HPC.

**PowerSwitch networking** — Modern workloads call for new thinking about network architecture. Based on open standards, our future-ready networking technology helps you improve network performance, lower networking costs and remain flexible to adopt new innovations. Take control of your network's future and learn how the Dell Technologies strategy for open networking can dramatically transform your business.

**PowerScale storage** — With support for multiple workloads and enterprise-grade data and file management capabilities out of the box, Dell PowerScale scale-out network-attached storage (NAS) is the leading storage for advanced computing. You can take advantage of its high capacity to reduce the acquisition and ownership cost for managing and monetizing data using HPC.

**NVIDIA Bright Cluster Manager** — Enable the deployment of clusters over bare metal with a management view that spans the hardware, operating system, software and teams.

**Validated Design for HPC Storage** — BeeGFS Storage — Deploy storage designed specifically to manage I/O-intensive workloads in performance-critical environments. Hundreds of leading enterprises worldwide choose BeeGFS for its ease of installation, massive scalability, robustness and exceptional flexibility, including converged systems where servers are used for storage and compute.

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## NVIDIA GPUs

NVIDIA GPUs accelerate CPUs, using parallel processing to crunch large volumes of data faster. GPU-accelerated servers deliver better economics, providing breakthrough performance with fewer servers and resulting in faster insights and lower costs.

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“Our partnership with Dell Technologies allows us to take advantage of the full breadth and depth of their compute, storage, networking and security solutions.”

— David J. Brzozowski Jr,  
Chief Technology Officer,  
Medacis<sup>11</sup>

## Services and financing

Dell Technologies is with you every step of the way, linking people, processes and technology to accelerate innovation and enable optimal business outcomes.

- [HPC Consulting Services](#) help you create a competitive advantage for your business. Our expert consultants work with companies at all stages to help you plan, implement and optimize solutions that enable you to unlock your data capital and support advanced techniques, such as HPC.
- [Deployment Services](#) help you streamline complexity and bring new IT investments online as quickly as possible. Leverage our 30-plus years of experience for efficient and reliable solution deployment to accelerate adoption and ROI while freeing IT staff for more strategic work.
- [Support Services](#) driven by artificial intelligence (AI) and deep learning (DL) will change the way you think about support with smart, ground-breaking technology backed by experts to help you maximize productivity, uptime and convenience. Experience more than fast problem resolution. Our AI engine proactively detects and prevents issues before they impact performance.
- [Payment Solutions](#) from Dell Financial Services help you maximize your IT budget and get the technology you need today. Our portfolio includes traditional leasing and financing options, as well as advanced flexible consumption products.
- [Dell APEX](#) offers a simple approach that gives you a wide range of consumption models, payment solutions and services, so you can optimize for a variety of factors while realizing more predictable outcomes.
- [Dell APEX for HPC](#) delivers Innovation-as-a-Service to help you accelerate time to discovery and innovation, with HPC use cases including Monte Carlo simulations for risk analysis.
- [Managed Services](#) can help reduce the cost, complexity and risk of managing IT, so you can focus your resources on digital innovation and transformation while our experts help optimize your IT operations and investment.
- [Residency Services](#) provide the expertise needed to drive effective IT transformation and keep IT infrastructure running at its peak. Resident experts work tirelessly to address challenges and requirements, with the ability to adjust as priorities shift.

## Why Dell Technologies is the best choice for HPC

We're committed to advancing, democratizing and optimizing HPC, and we've dedicated a great deal of resources toward that goal.

- Schedule an [executive briefing](#) and collaborate on ways to reach your business goals.
- [Dell Technologies Customer Solution Centers](#) are staffed with computer scientists, engineers and PhDs who are subject matter experts in a variety of disciplines.
- We are committed to [providing you with choice](#). We want you to get what you need and have a great experience working with us. If we don't have what you need, we'll tell you who does. We believe in being open, and we publish our performance results at [HPCatDell.com](#).
- Dell Technologies is the only company in the world with a portfolio that spans from workstations to supercomputers, including servers, networking, storage, software and services.
- Because Dell Technologies offers such a wide selection of solutions, we can act as your trusted advisor without trying to sell you a one-size-fits-all approach to your problem. That range of solutions has also given us the expertise to understand a broad spectrum of challenges and how to address them.

<sup>11</sup> Dell Technologies case study, [Advancing healthcare analytics and saving lives](#), January 2021.



## Customer Solution Centers

Our global network of dedicated [Dell Technologies Customer Solution Centers](#) are trusted environments where world-class IT experts collaborate with you to share best practices, facilitate in-depth discussions of effective business strategies and help your business become more successful and competitive. Dell Technologies Customer Solution Centers reduce the risks associated with new technology investments and can help improve speed of implementation.

## HPC & AI Innovation Lab

The [Dell Technologies HPC & AI Innovation Lab](#) in Austin, Texas, is the flagship innovation center. Housed in a 13,000-square-foot data center, it gives you access to thousands of servers, three powerful HPC clusters, and sophisticated storage and network systems. It's staffed by a dedicated group of computer scientists, engineers and subject matter experts who actively partner and collaborate with customers and other members of the HPC community. The team engineers HPC and AI solutions, tests new and emerging technologies, and shares expertise including performance results and best practices.

## HPC & AI Centers of Excellence

Dell Technologies worldwide [HPC & AI Centers of Excellence](#) provide thought leadership, test new technologies and share best practices. They maintain local industry partnerships and have direct access to Dell and other technology creators to incorporate your feedback and needs into their roadmaps. Through collaboration, Dell Technologies HPC & AI Centers of Excellence provide a network of resources based on the wide-ranging know-how and experience in the community.

## Proven Results

Dell Technologies holds leadership positions in some of the biggest and largest-growth categories in the IT infrastructure business, and that means you can confidently source information technology needs from Dell Technologies.

- #1 in servers<sup>12</sup>
- #1 in hyperconverged and converged systems<sup>13</sup>
- #1 in storage<sup>14</sup>
- #1 cloud IT infrastructure<sup>15</sup>
- See [Dell Technologies Key Facts](#).

<sup>12</sup> IDC, WW Quarterly Server Tracker CY21Q4. Revenue #1 position is tied.

<sup>13</sup> IDC, WW Quarterly Converged Systems Tracker CY21Q4.

<sup>14</sup> IDC, Quarterly Enterprise Storage Systems Tracker CY21Q4.

<sup>15</sup> IDC, [WW Quarterly Enterprise Infrastructure Tracker: Buyer and Cloud Deployment](#), Vendor Revenue, October 2021.

## Take the next step, today

Don't wait to harness the benefits of HPC on optimized solutions designed from the ground up to speed financial services workloads. Contact your Dell Technologies representative to find out more today.

### Contact us

To learn more, visit [dell.com/hpc](https://dell.com/hpc) or [contact](#) your local representative or authorized reseller.

