

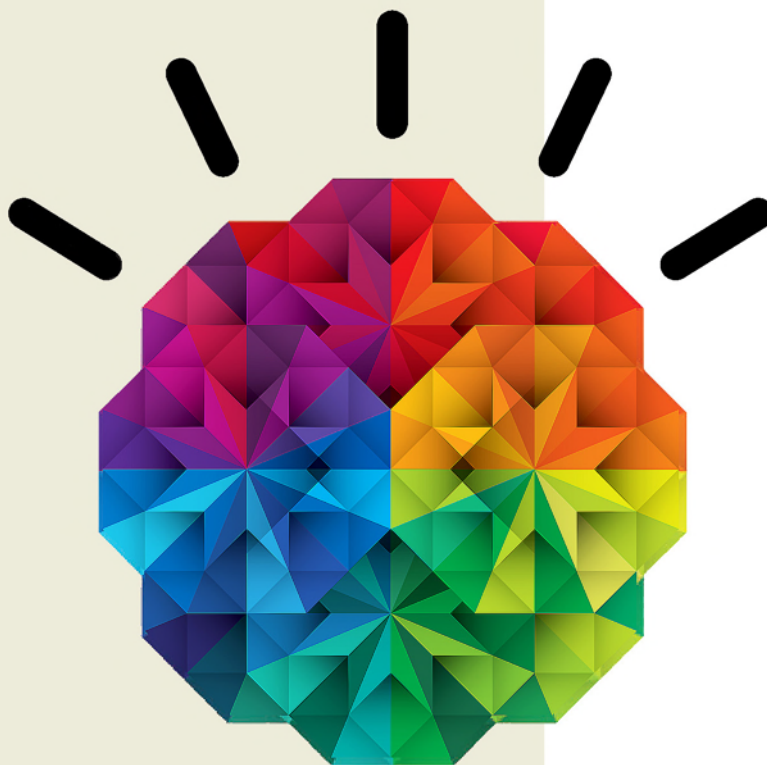
IBM PureSystems

Business Partner Guidebook

Your Roadmap to
Success with IBM
Expert Integrated
Systems



eBook



Edited by Jim Hoskins

IBM PureSystems Business Partner Guidebook

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IBM PureSystems Business Partner Guidebook

Second Edition

*Your Roadmap to Success with IBM
Expert Integrated Systems*

Edited by Jim Hoskins

(version 2.2e)



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Table of Contents

Introduction	11
About This Guidebook	11
Check for Updated Editions of This Guidebook	11
How to Use This MaxFacts™ Interactive Guidebook.....	12
Reader Feedback	13

Chapter 1:

IBM PureSystems Basics **14**

The Journey to Become Smarter	14
The Need for a New Approach to IT	15
IBM PureFlex System	18
IBM Flex System: The Building Blocks	18
IBM PureApplication System	20
IBM PureData System	21
Why IBM?	22

Chapter 2:

PureSystems Tools and Resources **25**

IBM PureSystems on PartnerWorld	25
Education & Certification	26
<i>Know Your IBM (KYI).....</i>	<i>27</i>
Certification.....	28
<i>For IBM PureFlex</i>	<i>28</i>
<i>For IBM PureApplication System</i>	<i>28</i>
Sales Configurator Tools for Building Solutions	29
Ordering.....	30
Sales Support	30

IBM PureFlex System Sales Kit	30
IBM PureFlex Sales Scenario Tactics	31
IBM PureFlex System Sales Plays	31
<i>Consolidate on IBM PureFlex System</i>	32
<i>Optimize with IBM PureFlex System</i>	32
<i>Innovate on IBM PureFlex System</i>	33
<i>Accelerate Cloud with IBM PureFlex System</i>	34
PureFlex Technology Access Initiative	35
<i>PureFlex Demo Program</i>	35
<i>PureFlex Loaner Program</i>	35
<i>PureFlex Proof-of-Concept (PoC) Program</i>	36
<i>PureFlex Try & Buy Trial</i>	36
<i>IBM Client Center Services</i>	37
Sources for Competitive Marketing Information.....	38
Web Content Syndication	38
Social Media Resources for IBM Business Partners	39
IBM Global Financing.....	39
Client Benefits	40
Business Partner Benefits	41
IBM Global Services	43
Technical Support Services for IBM PureFlex Systems	43
Integrated Technology Services for IBM PureSystems.....	44
Business Partner Technical Support for PureFlex	46
Techline.....	46
Ask PureFlex	46
CTS	46
Solution Assurance	47
Tools	47
Publications/Communications	49

Chapter 3:

PureSystems Quick Reference 50

PureFlex System	50
------------------------------	-----------

PureFlex Express	51
PureFlex Standard	51
PureFlex Enterprise.....	54
PureApplication System.....	56
PureData System	60
PureData System for Transactions.....	60
PureData System for Analytics	61
PureSystem for Operational Analytics.....	63
Flex System Building Blocks	64
Flex System Enterprise Chassis	64
Compute Nodes.....	66
x86 Compute Nodes.....	66
Flex System x220 Compute Node	67
Flex System x240 Compute Node	69
Flex System x440 Compute Node	71
Power Compute Nodes	74
p24L Compute Node (PowerLinux).....	74
p260-p460 Compute Nodes	76
Expansion Nodes.....	78
PCI Expansion Node	78
Storage Expansion Node	80
Storage	82
V7000 Storage Node.....	82
Storwize V7000 Unified Disk System	85
System Networking.....	87
Ethernet.....	88
EN4093R 10 Gb Scalable Switch	88
EN2092 1 Gb Ethernet Scalable Switch	90
EN4091 10 Gb Ethernet Pass-Thru Module	92
Fibre Channel	93
FC5022 8/16 Gb SAN Scalable Switch	93
FC3171 8 Gb SAN Switch/Pass-Thru Module	95
InfiniBand.....	96
IB6131 InfiniBand Switch	97
IB6132 2-port FDR InfiniBand Switch	98
Flex System Manager.....	99
Fabric Manager.....	100

Chapter 4:	
IBM Systems Lab Services and STG	
Technical Training	102
<hr/>	
Lab Services	102
STG Technical Training.....	103
About the Editor.....	105

Introduction

About This Guidebook

This MaxFacts™ interactive guidebook brings together—all in one place—the resources you need to be successful as an IBM PureSystems Business Partner. It contains information gathered and adapted with permission from multiple IBM and non-IBM sources. Also, there are embedded links to more-detailed information and news available on the Internet, so you always have the most current information at your fingertips. We are confident you will find this a useful reference tool.

As we are always working to better help you succeed, please forward any comments on or suggested improvements to this guidebook to info@maxpress.com.

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How to Use This MaxFacts™ Interactive Guidebook

This guidebook has been specially designed to be read on your computer screen using the free Adobe Acrobat Reader software or a supporting Web browser. Alternately, you can print this guidebook on almost any printer and read the material anywhere.

Reading on a computer screen at your desk isn't as cozy as reading a printed page while lying on a towel at the beach. If you give it a fair chance, however, you will find that navigating the bookmarks along the left side of the screen provides an effective way to get to the information you need—quickly. Further, the instant access to expanded information provided by the many embedded Web links, along with the “search” function, also makes using this guidebook “on screen” worthwhile. We recommend that you copy this PDF file to your desktop so it will always be only “one click away.” If you still want a hard copy, you can print it out on almost any printer.

Links provided throughout this guidebook (anywhere you see a “More on the Web” box or embedded within some figures) will lead you to additional information related to the topic at hand resident on the Web. In this way, this guidebook is a “three-dimensional guide” providing you with information about the topics at the level of detail you choose. To follow a link, simply click on it and a Web browser window will appear on your screen with the requested information. If the link brings you to a password-protected area (e.g., on the IBM



PartnerWorld or COMP Web sites), you will be prompted to enter your IBM-issued user ID and password before you are presented with information.

When you are finished exploring, just close or minimize the Web browser window and you will arrive back at the guidebook. You are encouraged to explore all links that interest you to get the most out of this guidebook. You must have an active connection to the Internet to use the embedded links.

To navigate around within this guidebook, you can:

- Step forward or backward a page at a time using the standard Acrobat Reader navigation toolbar
- Click on the “Bookmark” links shown on the left side of your screen to go directly to that part of the guidebook
- Click on the “Table of Contents” section and click on the links to go directly to that part of the guidebook
- Search for keywords in the document using the Acrobat Reader “Find” function (found on the toolbar).

Reader Feedback

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To see our full line of IBM titles, we invite you to visit our Web site, maxpress.com. From all of us at Maximum Press, thank you for your interest.

MORE ON THE WEB

- [email us \(info@maxpress.com\)](mailto:info@maxpress.com)
- Maximum Press Web site

1

IBM PureSystems Basics

The Journey to Become Smarter

Today, all around us, profound changes are taking place as industry after industry embarks on the transformational journey to become smarter. While the changes by industry may vary dramatically, they generally have one thing in common: the central role that IT plays in each.

No longer is IT simply responsible for back-office functions like billing and payments. It can drive both disruption and innovation in front-office processes and marketplace interactions. For example, in leading utility companies, IT is transforming power generation. And in healthcare, analytics systems are helping doctors improve the quality of their diagnoses and treatments. In banking, computing systems are doing much more than managing back-office operations; they're playing a pivotal role in front-office operations and in analyzing, predicting, and mitigating risk.

As information technology moves to the strategic center of business, organizations can no longer ignore the inefficiencies in today's approach to computing:





- On average, more than 65 percent of IT budgets in basic data centers are spent on maintaining existing infrastructure.¹
- Only 21 percent of organizations are operating at the highest level of efficiency. Those organizations allocate 50 percent more of their IT budget to new projects.²
- Nearly two-thirds of companies go over schedule on their project deployments.³
- About 93 percent of strategic data centers virtualize storage in their environments versus 21 percent of basic data centers.⁴
- Approximately 48 percent of all of a strategic data center's servers are virtualized, compared to 27 percent of a basic data center's servers.⁵

The Need for a New Approach to IT

So, what are some of the major pain points IT is facing?

- IT complexity—The need for simpler infrastructure, with a simpler management approach, and improved simplicity and control
- High operating expense—The need for an improved management approach and improved efficiency

¹ IBM, *Data center operational efficiency best practices*, April 2012.

² IBM, *Data center operational efficiency best practices*, April 2012.

³ IBM Market Insights, *2011 Business Benchmarking Time-to-Value Study*, October 2011.

⁴ IBM, *Data center operational efficiency best practices*, April 2012.

⁵ IBM, *Data center operational efficiency best practices*, April 2012.



- Poor system utilization—The need for improved agility, to better allocate resources whenever and wherever needed
- Inhibited time to market and time to value—The need for business agility to deliver value faster
- Public cloud averse—The need for the simplicity and agility of cloud, but with security, and control of critical data.

To overcome today's IT inefficiencies, the computing model must shift to smarter computing, in which IT infrastructure enables a smarter planet. The old paradigm of assembling disparate pieces and parts is becoming increasingly unwieldy. Virtualization promises greater resource utilization, greater energy efficiency, and less complexity. Yet virtualization introduces its own set of demands: “beefier” servers with the faster processors and larger memory capacities necessary to host many virtual machines (VMs), as well as servers, switches, and other equipment optimized for virtualization. In addition, there is the added complexity of managing all the physical and virtual hardware in the data center. Ideally, the management should be centralized and accomplished using one simple tool—not multiple tools that can only see either physical or virtual devices, or only one vendor's products.

The announcement of IBM PureSystems inaugurated a new era of computing. More than just a new server or family of servers, PureSystems introduced a new way of thinking about computing, offering previously unheard-of levels of out-of-

MORE ON THE WEB

- [IBM PureSystems info on IBM.com](#)



the-box integration and built-in expertise. The PureSystems family offers clients the flexibility to custom-build and tune their configurations, the simplicity of pre-configured, factory-integrated infrastructure and management, and the control of pre-integrated platform systems.

IBM's PureSystems family members include:

- **IBM PureFlex System:** Combines compute, storage, networking and virtualization capabilities under a single, unified management console into an infrastructure system that is expert at sensing and anticipating resource needs for your enterprise.
- **IBM PureApplication System:** A platform system designed and tuned specifically for transactional web and database applications. This workload-aware, flexible platform is designed to be easy to deploy, customize, safeguard, and manage. Whether you operate in a traditional or private cloud environment, this IBM solution can provide you with superior IT economics.
- **IBM PureData System:** Optimized exclusively for delivering transactional and analytics data services to today's demanding applications with simplicity, speed, and lower cost.
- **IBM Flex System:** Customers build their own systems to meet their unique IT requirements with a set of no-compromise components, including compute, storage, networking, and systems management.



IBM PureFlex System

IBM PureFlex System combines advanced IBM hardware and software with patterns of expertise and integrates them into optimized configurations that are simple to acquire and deploy, so IT achieves faster time to value.

- **IBM PureFlex System:** For a pre-configured, pre-integrated infrastructure with integrated management and cloud capabilities, factory tuned from IBM with x86 and IBM POWER compute nodes, IBM PureFlex System is the answer.

IBM Flex System: The Building Blocks

Flex System is much more than the next generation of BladeCenter; it is the best blade product available in the world. Flex System's design delivers greater integration between networking, compute, and storage resources than ever before, and it is built on a platform that is designed for the next decade of technology advances.

- **IBM Flex System:** IBM Flex System is the right fit to custom-build and tune a configuration to meet specific requirements, using the most advanced blade server on the market with maximum x86 and POWER compute and memory performance. Some clients will choose this option because PureFlex System solutions include base configurations (Express, Standard, or Enterprise) that may not fit their specific environment requirements. IBM Flex System is not referred to as an Expert Integrated System because it is not configured, integrated, and tested at the factory by IBM experts using IBM expertise and experience, and unlike IBM PureFlex, IBM PureApplication Sys-



tem and IBM PureData System, it doesn't contain the solution layer installed/integrated, etc., and the value that brings to a client in terms of time-to-value (across several dimensions).

With either choice, customers get extraordinary compute power, storage capability, and networking flexibility with the latest processors and a no-compromise design. Advantages include:

- More than twice the application density in the same floor space⁶
- Energy cost reductions of up to 40 percent.⁷

According to Clabby Analytics, IBM Flex System is the best blade offering on the market.⁸ But IBM Flex System is much more than just a blade offering, it's the next generation of general business systems.

IBM Flex System was designed from the ground up to address the issues described above, from servers with industry-leading memory capacity and processors, to a chassis designed to accommodate leading-edge technologies both today and the future, to switches and storage designed to simplify virtualization, to a management appliance that can manage every device, both physical and virtual, simply and centrally, from IBM and other vendors.

⁶Based on IBM testing and documented in *IBM System x Virtualization Server Consolidation sizing methodology*. The IBM Flex System x240 Compute Node supports 2.7X more Peak Utilization Virtual Machines (VMs) than previous generation BladeCenter blades.

⁷Flex System x240 Compute Node requires 40 percent less energy than earlier-generation Intel x86 processor-based servers.

⁸<http://www.clabbyanalytics.com/uploads/FlexvsBladesFinal.pdf>



Chapter 3 takes a closer look at the IBM PureFlex System, and provides more detail on the IBM Flex System.

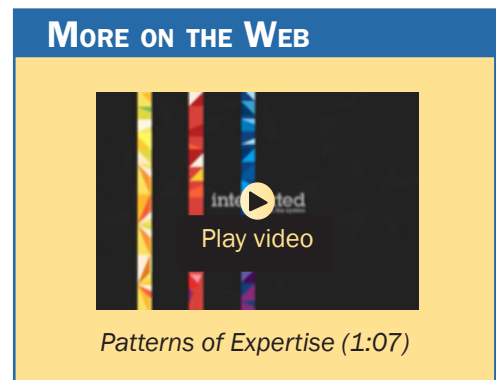
IBM PureApplication System

IBM PureApplication System pre-integrates a full application platform set of middleware and expertise with a single management console. It is a workload aware, flexible platform that is designed to be easy to deploy, customize, safeguard, and manage in a traditional or private cloud environment, ultimately providing superior IT economics.

With the IBM PureApplication System, you can provision your own patterns of software, middleware, and virtual system resources. These patterns enable you to customize your solution to deliver expertise from a broad ecosystem, deployable in an efficient manner, delivering faster time to value. You can provision patterns within a unique framework that is shaped by IT best practices and industry standards—standards that have been culled from many years of IBM experience with clients and from a deep understanding of smarter computing. These IT best practices and standards are infused throughout the system.

With IBM PureApplication System:

- IBM builds expertise into preintegrated deployment patterns, which can speed the development and delivery of new services.





- Built-in expertise capabilities can reduce the cost and time required to manage an infrastructure by automating key processes, such as application deployment.
- Built-in application optimization expertise reduces the number of unplanned outages through best practices and automation of the manual processes identified as sources of those outages.
- Administrators can use built-in application elasticity to scale up or to scale down automatically.
- Data replication is used to increase availability.

Chapter 3 provides configuration details about IBM PureApplication System.

IBM PureData System

The new IBM PureData System is optimized exclusively for delivering data services to today's demanding applications. Like each of the IBM PureSystems, it offers built-in expertise, integration by design, and a simplified experience throughout its life cycle.

- Built-in expertise—Codified data management best practices are provided for each workload. PureData System delivers automated pattern-based deployment and management of highly reliable and scalable database services.
- Integration by design—Hardware, storage, and software capabilities are designed and optimized for specific high performance data workloads such as patented data filtering using

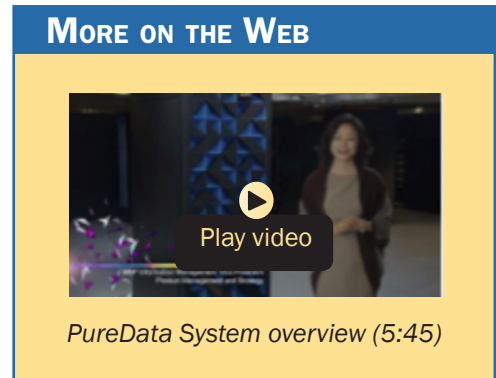


programmable hardware (FPGAs) for ultrafast execution of analytic queries without the need for indices.

- Simplified experience—The PureData System provides single part procurement with no assembly required (ready to load data in hours), open integration with third party software, integrated management console for the entire system, single line of support, integrated system upgrades, and maintenance.

The new PureData System comes in different models that have been designed, integrated and optimized to deliver data services to today's demanding applications: transactions, analytics, and operational analytics.

Chapter 3 provides configuration details about IBM PureData System models.



Why IBM?

For more than 100 years, IBM has been at or near the center of every major turning point in computer science. We introduced the first computer designed specifically for businesses in 1953, but we haven't remained in the forefront by clinging to the past. IBM understands that lasting economic value is not created simply by deploying a new piece of hardware or a new software program. We understand the importance of applying core principles of an architecture approach across entire IT systems. With our clients, we've been working with



deeply integrated systems long enough to know that a software company can't simply acquire a hardware company, package those products together and call it integration. Expertise is required to turn a collection of software and hardware components into something useful and create significant business value.

IBM designs, builds, and integrates products for nearly every element of an organization's computing portfolio, including microprocessors, servers and storage devices, operating systems, software programming tools, middleware, business intelligence applications, and industry-specific software frameworks.

Today, we're doing much more than integrating or packaging technology components. We're simplifying virtually every aspect of the client experience—from procurement to deployment to management to upgrade and support—without sacrificing flexibility or choice. We do that by building in expertise from IBM solutions and services, our Business Partners and our clients that have their own library of best practices. We bottle up decades of client engagements, data center optimizations and research, which requires not experience but a culture that builds process around and institutionalizes knowledge and expertise. And it requires structure that includes leading technology and business consulting services. This is how we change the experience and economics of IT. And this is what makes our approach very different from other approaches in the marketplace today and what will make imitating expert integrated systems a challenge.



The depth and breadth of IBM solutions, services, and expertise, as well as our ecosystem of Business Partners, positions us as a technology leader capable of delivering on the promise of expert integrated systems. We work side by side with IBM Business Partners to create distinctive client value through our combined capabilities, experience, and offerings. IBM will continue to build out this broad, open-application ecosystem to provide our clients with a portfolio of solution providers that serve both cross-industry and industry-specific solution areas, addressing the need for choice and flexibility.

IBM's value proposition is clear: for organizations seeking to transform their IT economics, we offer advanced solutions that are simple, flexible, open, and efficient.

2

PureSystems Tools and Resources

This chapter provides you with some general information and valuable resources that will help you as you sell IBM products.

IBM PureSystems on PartnerWorld

IBM maintains a Web site called PartnerWorld, which has a great deal of information of use to all IBM Business Partners worldwide. On the site you will find the latest presentations and marketing materials (such as brochures, data sheets, and case studies) as well as competitive information, consultant reports, IBM white papers, education and events, tools, technical support, and much more.

Business Partners who invest the most in IBM receive higher-value benefits and resources. This investment is recognized through three PartnerWorld membership levels: Member, Advanced, and Premier. Qualification for these membership levels is based on the Business Partner's attainment according to a point system. Points are earned by acquiring skills, developing and selling solutions, driving IBM revenue, and achieving customer satisfaction.





In this guidebook, we have summarized and provided direct links to a great deal of PartnerWorld information of interest to Business Partners selling IBM PureSystems offerings. As such, this guidebook is your personal “guide” to the PartnerWorld Web site. Just the same, we encourage you to spend some time browsing the PartnerWorld site, which is constantly updated so you can get a feel for the full scope of resources available to you.

You will need your IBM-assigned user ID and password to access some areas of PartnerWorld. If you don’t have your user ID and password, you can contact IBM PartnerWorld for help. (Follow the link provided in the “More on the Web” box.)

MORE ON THE WEB

- [PureSystems portal on PartnerWorld](#)
- [PureFlex info on IBM.com](#)
- [Flex System portal on PartnerWorld](#)
- [PureData portal on PartnerWorld](#)
- [PureApplication portal on PartnerWorld](#)
- [IBM PartnerWorld Web site home page](#)
- [IBM PartnerWorld news and newsletters](#)
- [PartnerWorld membership levels](#)
- [Help with your user ID and password](#)

Education & Certification

As with almost any endeavor, time spent educating yourself and your team on appropriate topics such as selling techniques and PureSystems product offerings will help you succeed. In this section, we discuss options for you to obtain the PureSystems–related education you need.

Education for all IBM systems offerings can be found in PartnerWorld Systems College. PureSystems is no exception.



The education will help provide product details as well as how to position and sell PureSystems to your customers.

When you open the links below, you will find a “What’s New” section, which lists all of the training added within the last three months. You will also find a tab with education

“Roadmaps” to help guide you through the courses. The roadmaps are organized in basic and intermediate tracks. The last tab, “Job Role Course Catalog”

MORE ON THE WEB

- [STG Sales Education Newsletter](#)
- [Solution Sales Representative](#)
- [Technical Sales Support Specialist/Consultant](#)
- [Implementer/Systems Engineer](#)
- [eLearning Modules](#)

tab, provides access to all available education. You can use this area to perform keyword searches for educational material.

The PureSystems sections of Systems College was established on the day of the launch. You should continue to check back periodically to see new content updates.

In addition to the content in Systems College, we offer occasional live virtual sessions as well as face-to-face events. The STG Education newsletter is a good place to stay on top of new offerings.

Know Your IBM (KYI)

Know Your IBM is a permission-based interactive marketing and selling resource designed for you, our Business Partner sellers. It provides net, customized, online education modules focusing on strategic product and solution areas. The education helps increase your understanding and awareness of the



key features and business benefits of IBM products, solutions, and offerings. Incentives offered in conjunction with Know Your IBM are designed to encourage you to complete the education modules and provide rewards for your sales performance. Incentives are awarded at the individual rep level, not to the firm.

MORE ON THE WEB

- [“Know Your IBM” training modules](#)

Certification

In order to have authorization to sell the PureSystems family, business partners must build their skills and pass exams.

For IBM PureFlex

The IBM PureFlex Sales (test number 000–780) are available in Prometric Test Centers worldwide. These new certifications cover all currently announced PureFlex products, features, and functions. To register or locate a convenient test center, use the new Prometric online registration link.

MORE ON THE WEB

- [Prometric online registration](#)
- [Professional Certification for PureFlex](#)

Access the Professional Certification section from the IBM Web site in the “More on the Web” box for additional information on this certification, including test preparation activities.

For IBM PureApplication System

The PureApplication System Sales Mastery and Technical Sales Mastery (TSM) exams are available on Prometrics today and we are encouraging Partners to get certified.



MORE ON THE WEB

- [PureApplication System Sales Mastery \(SM\) exam](#)
- [PureApplication System Technical Sales Mastery \(TSM\) exam](#)

Test preparation links:

- [IBM PureApplication System Sales Kit—Client Presentation, Data Sheet, Demos, Education, etc. \(2.5 hours\)](#)
- [developerWorks PureSystems—Features \(2.0 hours\)](#)
- [PureApplication Systems—Video Series \(2.5 hours\)](#)
- [developerWorks PureSystems—Preparing for PAS \(2.0 hours\)](#)
- [IBM PureApplication System Technical Sales Master Study Guide available on Sales Kit—\(6.0 hours\)](#)

Sales Configurator Tools for Building Solutions

The IBM Configurator for e-business (e-config) has been enhanced to help you configure, price, and place an order for the PureFlex System.

Should you require Build to Order (BTO) Flex System products, they may be configured using the Standalone Solutions Configuration Tool (SSCT), the IBM System x & Cluster Solution Configurator (x-config), the IBM Configurator for e-business (e-config), or the IBM Hardware Configurator.

MORE ON THE WEB

- [Sales tools](#)
- Configurators
- [SSCT](#)
 - [x-config](#)
 - [IBM Hardware Configurator](#)
 - [e-config](#)



Ordering

All PureFlex System offerings will be ordered in Partner/Commerce/Server or via your local ordering system.

Should you require Build to Order (BTO) Flex System products, they will be ordered in Partner Commerce, EDI, or via your local ordering system.

Sales Support

Sales support is available from your distributor, your business partner sales representative, and the IBM PureSystems Tiger Teams. Follow the link in the More on the Web box to find out who to contact.

Also, IBM has created a variety of sales enablement assets to help you along the sales cycle—for a complete directory, go to our asset library link.

Especially helpful when starting to consult with clients on their IT challenges, is to understand how the PureSystems family is positioned within the IBM family of offerings, as well as against competition in the marketplace. For a better understanding of this positioning, you may check out the “positioning” link.

MORE ON THE WEB

- [Key Contact listing on PartnerWorld](#)
- [Asset library](#)
- [Positioning](#)

IBM PureFlex System Sales Kit

The IBM PureFlex Sales Kit consolidates all of the relevant assets and deliverables related to the PureFlex offerings into



one easy to search document on PartnerWorld. In the sales kit you will find product brochures, white papers, videos, proposal inserts and solution briefs, and more, as well as links to other relevant assets to help

MORE ON THE WEB

- [IBM PureFlex System Sales Kit on PartnerWorld](#)
- [IBM Flex System Sales Kit](#)

you in your sales efforts. The IBM Flex System Sales Kit is the repository to help IBM sellers sell the compute node, chassis, networking, storage, and management nodes. All content is kept up-to-date in this repository for access by IBM sellers.

IBM PureFlex Sales Scenario Tactics

Identify opportunities, generate leads, and win business with “quick start” sales tactics. Leverage high-impact sales assets for specific sales scenarios and deliver compelling value proposition to your clients. Convert your “Opportunities” to a “Win.”

MORE ON THE WEB

- [PureFlex Sales Scenario Tactics](#)

Identify target clients and prospects in your local region, and pursue opportunities with a focused set of sales tactics and assets.

IBM PureFlex System Sales Plays

The IBM PureFlex System Sales Plays map to our four customer initiatives: Consolidate, Optimize, Innovate and Accelerate Cloud. These initiatives are the “entry points” to client engagements for PureFlex System. Each play describes the



different target audiences within a client, their pain points associated with the initiative, and the unique features and benefits of PureFlex System that address those concerns. The plays also contain links to assets which support your sales efforts under each initiative.

Below you will find some examples of PureFlex sales plays.

Consolidate on IBM PureFlex System

This sales play is intended for clients that have an IT environment with multiple platforms and management systems experiencing complexity and low resource utilization.

MORE ON THE WEB

- [Sales Play: Consolidate on IBM PureFlex System](#)

The “Consolidate” aspect of the IBM PureFlex System offers the client the ability to reduce the number of assets within the IT center while increasing utilization, enabling new workload growth, increasing overall performance, and significantly reducing operational and management costs by leveraging a centralized management over all compute, network, and storage resources.

Optimize with IBM PureFlex System

Help your clients move from underutilized, overprovisioned IT to an efficient, cost effective platform managed by industry-leading cloud software. This play is intended for sellers whose clients’ critical workloads and applications are consuming major portions of their IT budgets just to maintain, keep up with capacity demands, and deliver on their SLAs. The play also addresses clients whose key database and application server



elements of the workloads may be underperforming or scaling inadequately to meet peak workload demands.

MORE ON THE WEB

- [Sales Play: Optimize with IBM PureFlex System](#)

Key value association with this sales play: Optimize your existing high value workloads through improved virtualization and centralized management.

Innovate on IBM PureFlex System

This sales play is intended to focus sellers on the innovation and benefits of the IBM PureFlex System. The PureFlex System delivers a new level of agility, efficiency, and control to customers when implementing and managing applications. New services are deployed faster by streamlining the install, load, and configure processes on these expert integrated systems with servers, storage, and network resources all managed together. The integrated systems management and security features enable simplified management and control of the IT infrastructure while reducing costs. Pooled systems resources improve workload performance and help clients address changes to rapidly changing business demands. In essence, we can help clients rapidly deliver new and innovative applications, processes, and services. Innovation enables business to gain competitive advantage by incorporating the latest expertise and thinking into IT services, facilitating new ideas and the

MORE ON THE WEB

- [Sales Play: Innovate on IBM PureFlex System](#)



organizational and process changes necessary to implement them, and quickly deploying new services to address dynamic customer and marketplace demands. New application deployment is simplified with the PureFlex System. IBM and its business partners have worked together to package industry-leading applications, making them quick and simple to load, install, and configure.

Accelerate Cloud with IBM PureFlex System

Help your clients move from underutilized, over-provisioned IT to an efficient, cost-effective platform managed by industry-leading cloud software. This play is designed to help sellers understand these new products and how PureFlex

Systems can deliver superior customer value through

the cloud. Learn how IBM PureFlex Systems provide an ideal platform upon which clients can build flexible, secure cloud solutions to deliver infrastructure services (IaaS). PureFlex Systems features include IBM SmartCloud Entry and enhanced security levels pre-set to enable rapid cloud deployments and reduce management costs. Take advantage of the quick paths to education materials, demos, and presentations within this play to become an expert in Expert Integrated Systems and the PureFlex System family.

Key value association: Implement Cloud Workload Virtualization, and Centralized Management.

MORE ON THE WEB

- [Sales Play: Accelerate Cloud with IBM PureFlex System](#)



PureFlex Technology Access Initiative

The Technology Access Initiative has been designed to give IBM Authorized Business Partners access to IBM PureFlex technology through demo units, loaners, proof-of-concept loans, and other capabilities. The intent of this global program is to engage and enable authorized IBM Business Partners to invest in IBM PureFlex Systems technology for the purposes of demonstration, evaluation, and business development activities.

MORE ON THE WEB

- [Email: PureSystems TechAccess at puresys@us.ibm.com](mailto:puresys@us.ibm.com)
- [Expert Integrated Systems Contacts](#)
- [Business Partner “Request Form”](#)

PureFlex Demo Program

Under this program, IBM Authorized Business Partners can purchase or lease a demo unit for internal demonstration, development and evaluation activities. Specific terms and conditions will apply. Lease offerings are provided by IBM Global Financing.

To order a PureFlex System demo unit, business partners must contact their local/regional authorized distributor, or local IBM Business Partner Channel Sales representative.

PureFlex Loaner Program

Under this program, IBM Authorized Business Partners can be loaned a PureFlex System, standard configuration, for up to a 30-day period. Approved usage for such loans are designed



to enable, educate, and drive demand generation activities. Specific terms and conditions will apply.

To request a PureFlex Systems Loaner Unit, business partners must submit a “Request Form” and may also contact their local IBM Business Partner Channel Sales representative.

MORE ON THE WEB

- [Business Partner “Request Form”](#)
- Email: puresys@us.ibm.com for more info

PureFlex Proof-of-Concept (PoC) Program

Under this program, IBM Authorized Business Partners can help secure a PoC for their customers. PoC duration will be for a period not exceeding 30 days to test and evaluate a well-defined customer solution. Specific terms and conditions will apply.

To request a PureFlex System Proof-of-Concept (PoC) Unit, business partners must submit a “Request Form” and may also contact their local IBM Business Partner Channel Sales representative.

In addition, as part of Technology Access, a number of additional capabilities are available for IBM Authorized Business Partners.

MORE ON THE WEB

- [Business Partner “Request Form”](#)

PureFlex Try & Buy Trial

IBM Authorized Business Partners can help secure a PureFlex Try & Buy Trial for their customer for a specified period of time, with predetermined test criteria agreed to by the cus-



tomer, and with the intention of selling the asset to the customer at the end of the trial period.

MORE ON THE WEB

- [Business Partner “Request Form”](#)

To request a Try & Buy trial unit, business partners must submit a “Request Form” and may also contact their local IBM Business Partner Channel Sales representative.

IBM Client Center Services

Client Center Services are designed to provide access to globally shared, large scale, physical and virtual infrastructure and technical expertise through IBM Executive Briefings Centers, Design Centers, and Benchmark Centers.

- Executive Briefing Centers deliver comprehensive technology briefings, remote and live product demonstrations, and solution workshops.
- Design Centers architect and integrate emerging, end-to-end solutions and create high value assets that leverage leading-edge technologies.
- Benchmark Centers provide clients with benchmark, proof-of-concept, scaling, and performance services and assistance in executing ISV application benchmarks.

To request IBM Client Center Services, business partners must submit a “Request Form” and may also contact their local IBM Business Partner Channel Sales representative.

Availability and approval of requests will be at IBM’s Business Partner Organization’s Sales discretion. If you have



MORE ON THE WEB

- [Business Partner “Request Form”](#)
- [Client Center Services Flyer and Sales Accelerator Offerings Portfolio](#)
- [Client Center demo offerings](#)

questions, please contact your Local Channel Sales Representative or forward your questions to PureSystems TechAccess.

Sources for Competitive Marketing Information

IBM maintains a Web site called “Comp,” which is a world-wide portal for information that will help you win in competitive marketing situations. It includes a searchable set of reports, presentations, and quick reference cards about the marketplace, competitors, and competitive products. You will find materials developed by IBM as well as outside sources such as Gartner, IDC, DH Brown, and IDEAS International.

IBM also publishes the Competitive Sales Guide for eligible business partners, which provides much useful information.

MORE ON THE WEB

- [IBM “Comp” Web site](#)

Web Content Syndication

IBM PureSystems digital marketing content is now available for syndication on your Web site. Web Content Syndication combines the power of content syndication, automatically sending and updating content, with built-in lead response tracking capabilities. It keeps prospects on your Web site and



leads go directly to you. Currently syndicating Business Partners can simply go to their partner console and select the PureSystems Showcase. IBM Business Partners who want to start using Web Content Syndication should register on PartnerWorld. This is a free benefit for all PartnerWorld members. Be the first to start syndicating content for the new PureSystems offerings!

MORE ON THE WEB

- [Web Content Syndication](#)

Social Media Resources for IBM Business Partners

Social media is quickly growing in importance for businesses of all sizes. Whether you are already involved in social media or just getting interested, the “More on the Web” box provides some links that will be of interest to you.

IBM Global Financing

With IBM Global Financing at your side, you can lead your clients into the world of smarter computing, while helping grow your business to become more profitable. In fact, IBM Market Intelligence data demonstrated that the odds of winning deals greater than \$100,000 increased by 36 percent when Business Partners include IBM Global Financing in the sale (*source: IBM Market Intelligence Data Analytics “Win More” study of Seibel opportunities*).

Simply put, recommending IBM Global Financing to finance IBM PureSystems is a win-win situation for both you and your clients.



MORE ON THE WEB

- [IBMPureSystems Twitter @IBMPureSystems](#)
- Tweekchat Twitter host @IBMPureSystems, Chat hashtag: #ExpertSysChat
- [TwebEvent Page](#)
- [PureSystems Blog](#)
- [PureSystems YouTube channel](#)
- [PureSystems Social Media Aggregator](#)
- [SlideShare](#)
- [PureSystems Flickr](#)
- [Communities for Business Partners](#)
- [Twitter search results for IBM PureSystems](#)
- [Search Twitter for mentions of your business or competitors](#)
- [Google blog search results for IBM PureSystems](#)
- [Search blog for mentions of your business or competitors](#)
- [LinkedIn social network \(has an IBM Business Partner Group\)](#)
- [Use Twitter to Grow Your Business \(IBM Software Business Partner Blog\)](#)

Client Benefits

When clients combine a Fair Market Value lease with a 90-day payment deferral, they can:

- Lower their total cost of ownership by as much as 16 percent. *(Represents Net Present Value savings over a 36-month period for an IT infrastructure Fair Market Value lease, "best credit" customer. Current IBM Global Financing monthly rates for IBM hardware used to calculate present value savings. Savings can vary according to hardware platform).*



- Conserve cash to use for other strategic needs and investments.
- Maximize cash flow and accelerate time to value with payment terms that align PureSystems costs with anticipated benefits.
- Add capacity or upgrade, often at little or no increase in monthly payments.
- Reduce the risk of technological obsolescence.
- Dispose of unneeded technology without hassle or risk.

Note: 90-day deferral for PureSystems financing subject to client credit approval. Interest accrues during deferral period. Restrictions may apply. Contact IBM Global Financing for more details.

Business Partner Benefits

By providing your clients the benefits of financing through IBM Global Financing, you'll be able to:

- Open up opportunities for larger deals since your clients will have more purchasing power
- Maintain account control—Clients that finance tend to become repeat customers
- Eliminate credit risk—IBM Global Financing will handle all credit approvals and assume the risk of collection
- Reduce pressure to discount as clients can obtain solutions through affordable monthly payments



MORE ON THE WEB

- [Financing Expert Integrated Systems](#)
- [Financing for IBM PureSystems](#)
- [Payment calculators and the Rapid Online Financing tool](#)
- [Getting Started with IBM Global Financing](#)
- [Rapid Online Financing tool for creating a quote](#)
- [Become an IBM Global Financing Partner/Financing Associate](#)

- Reduce your Days Sales Outstanding (DSO)—IBM Global Financing will pay you in an average of five days vs. 60–90 days in which your clients pay you. This puts more operating cash into your business
- Earn commission fees when clients finance eligible transactions.

IBM Global Financing can help finance consulting and migration services for your clients—from IBM as well as Business Partners.

IBM Global Financing offerings are provided through IBM Credit LLC in the United States and other IBM subsidiaries and divisions worldwide to qualified commercial and government clients. Rates and availability are based on a client's credit rating, financing terms, offering type, equipment and product type and options, and may vary by country. Non-hardware items must be one-time, non-recurring charges and are financed by means of loans. Other restrictions may apply. Rates and offerings are subject to change, extension, or withdrawal without notice and may not be available in all countries.



IBM Global Services

IBM Global Technology Services (GTS) subject matter experts served as a key source of the expertise and intelligence infused into PureSystems. And now they're ready to help you enable your clients to take advantage of this technology and accelerate the value of their PureSystems investment.

IBM GTS has decades of IT services experience gained as one of the world's largest systems integrators and managers of IT infrastructure. As a result, we can help you deliver complete end-to-end PureSystems solutions to your clients—across design & architecture, complex migrations, technical support, resiliency, and cloud.

Attaching IBM Global Technology Services to your IBM solution sales gives you a way to enhance your productivity, accelerate sales, and increase deal size today while creating ongoing revenue opportunities for the future—creating offerings that are more attractive to your clients than ever before.

Technical Support Services for IBM PureFlex Systems

IBM Technical Support Services offers world-class remote and on-site technical support to maximize the agility, efficiency, simplicity, and control offered by PureSystems. In addition to the Next Business Day warranty service that is included with the PureFlex and Flex Systems, our three Global Centers of Competence are set up to provide integrated support for the IBM Flexible System Manager.

Each IBM PureFlex System configuration contains pre-defined Technical Support Services that need to be included in every solution sale. Additional Technical Support Service op-



tions are also available for both IBM Flex and PureFlex Systems. These services include:

- Warranty service upgrades (WSU)
- Software maintenance (SWMA)
- Software support (Support Line)
- Enhanced technical support (ETS)
- Hard Drive Retention Services.

Integrated Technology Services for IBM PureSystems

IBM has deep IT services skills in providing cloud services, infrastructure assessment, design and architecture services, resiliency, networking and implementation services. We can partner with you on PureSystems to help your clients in these key areas:

- **Confidently add PureSystems to your enterprise IT landscape**—IBM strategy and design services can help clients adopt PureSystems to optimize their infrastructure by creating a strategy, business case, and architecture that lets them minimize risk and maximize ROI.

MORE ON THE WEB

- [PureSystem Global Technology Services info on PartnerWorld](#)
- [Flex System Technical Support Services info on PartnerWorld](#)
- [Webinar on PureSystems Global Technology Services \(audio and slides\)](#)



- **Prioritize workload transition to PureSystems**—IBM research-based workload analysis services can help clients map the right workload to the right platform, prioritize workload transition to PureSystems, and integrate these systems into existing service management processes.
- **Ready your data center facility for PureSystems**—IBM facilities assessment and design services can help quickly deploy high density PureSystems technology while optimizing cooling efficiencies and reducing related power consumption to help increase system uptime by potentially reducing outages caused by high heat conditions.
- **Fast-track PureSystems implementation and minimize risk**—IBM implementation services can help clients customize PureSystems to their IT environment, accelerating the time to value by helping clients understand how to leverage its new functionality.
- **Prepare your networks for PureSystems**—IBM network strategy and optimization services can combine business plans for PureSystems with an assessment of clients' current network to identify, design, and deploy any necessary network specific actions.
- **Enhance PureSystems resiliency**—IBM automated cloud-based recovery services for PureSystems can help reduce recovery time and improve the reliability of clients' recovery infrastructure through a fully managed recovery solution and security-rich managed protection of critical data.



- **Enhance cloud delivery**—PureSystems and IBM Smart-Cloud Services allow clients to develop and implement their own flexible and secure hybrid cloud strategy across private, public, and hybrid deployments to optimize performance.

Business Partner Technical Support for PureFlex

The path for support starts with Techline, then CTSS/FTSS/CTS, then Tiger Team, and then ATS/Centers. Business Partner opportunities are treated like direct opportunities from a technical pre-sales support point of view.

Techline

Skilled specialists provide voice and email support for product information and positioning, solution design, configuration validation, pricing and performance, education, solution assurance, competitive solutions, and more.

MORE ON THE WEB

- [Contact Techline](#)

Ask PureFlex

You can get assistance by emailing askPureFlex@us.ibm.com.

CTS

CTS is Channel Technical Sales. If the business partners are not aware of their CTS, they can engage them through their CRP or iCRBP. CTS Customer Technical Support will be engaged if the end user is assigned that resource. 888-771-7705.



Solution Assurance

Pre-sale Technical and Delivery Assessments (TDAs) are required for all PureFlex Foundation opportunities. Make sure you are familiar with the Solution Assurance Process and that you check the Solution Assurance Trigger Criteria and Designated Product List for the most current requirements for PureSystems.

MORE ON THE WEB

- [Trigger Criteria and Designated Product List](#)
- [PureFlex Pre-sale TDA Checklist](#)
- [Learn more about Solution Assurance](#)

- The PureSystems family is listed on the Trigger Criteria and Designated Product List under the Cross-brand category.
- The PureFlex Pre-sale TDA checklist is posted in the Solution Assurance Library in PartnerWorld. The checklist contains pre-sale and pre-install questions. If your opportunity is for a Proof of Concept (PoC), then use the streamlined set of questions highlighted in yellow and marked with (PoC).
- For more information on the Solution Assurance Process, consult your Distributor or visit the links provided in the “More on the Web” box.

Tools

[Figure S.1](#) provides a listing of tools to help you consult with customers about IBM PureSystems solutions.



Tool	Description	Where to find it
Alinean IBM PureFlex System TCO Analysis	This analysis tool compares the total cost of ownership for the IBM PureFlex Solution versus a traditional dedicated or virtualized IT infrastructure by collecting information about the current computing needs and then projecting the TCO for the two alternatives.	IBM PureFlex System TCO Analysis Tool: https://roiana-lyst.alinean.com/ibm_stg/AutoLogin.do?d=952527645846041243
ATS SCON Monitor Tool	Comprehensive server consolidation data collection and reporting; a free tool in the form of a service offering that provides customers with a report detailing the workload and utilization of their production systems.	External: http://www-03.ibm.com/support/techdocs/atmastr.nsf/WebIndex/PRS4663
IBM Systems Workload Estimator	Web-based sizing tool for IBM Power System, System x, IBM PureFlex System, IBM Flex System, and System z. It can be used to size new systems, upgrades/migrations from existing systems, and consolidations.	Main Page: http://www.ibm.com/systems/support/tools/estimator
Power Configurator	Tool used to calculate energy savings	External: http://www-03.ibm.com/systems/bladecenter/resources/powerconfig.html
IBM Sizing Guides	IBM Sizing Guides provide point-and-click access to software solution specific hardware requirements to meet customer immediate and growth requirements on IBM systems	External: http://www-304.ibm.com/partnerworld/wps/sizing/index.jsp
Visio stencil collection	IBM's Visio stencil collection has been updated to include Flex	External: http://www.visio-cafe.com/ibm.htm
Data Collection/Analytics		
Insight for SAP V5	Free service offering that provides customers with a report detailing the workload and utilization of their production SAP system.	http://www.ibm.com/erp/sap/insight
Insight for Oracle Database V2	Free service offering that provides customers with a report detailing the workload and utilization of their Oracle database servers.	http://www.ibm.com/erp/oracle/insight
Sizing, Competitive Consolidation		
Disk Magic	Enables you to estimate IBM disk subsystem performance. The tool models IBM disk controllers in z Series, i Series, and Open environments. The IBM disk controllers supported are DS8000, DS6000, DS5000, DS4000, SVC, V7000, and SAN attached N Series.	Partners

Figure S.1. IBM PureSystems tools at a glance (and links). (continued on next page)



Power (Energy) & Cooling

IBM Systems Energy Estimator

Web-based tool for estimating power requirements for IBM Power Systems™. You can use this tool to estimate typical power requirements (watts) for a specific system configuration under normal operating conditions.

[IBMers and Partners](#)

Figure S.1. IBM PureSystems tools at a glance (and links). *(continued from previous page)*

Publications/Communications

See the “More on the Web” box for information sources related to IBM PureSystems.

MORE ON THE WEB

- [IBM Flex System Information Center](#)
- [IBM Flex System Interoperability Guide](#)

Redbooks

- [IBM PureSystems introduction Redbook Webdoc](#)
- [Additional PureSystem Redbooks](#)

3

PureSystems Quick Reference

In this chapter, we will explore the specific offerings in the IBM PureSystems family.

PureFlex System

IBM PureFlex System combines advanced IBM hardware and software along with patterns of expertise and integrates them into three optimized configurations that are simple to acquire and deploy so you get fast time to value for your solution.

The three PureFlex System configurations are:

- **IBM PureFlex System Express:** Designed for small and medium businesses—the most affordable entry point for PureFlex System.
- **IBM PureFlex System Standard:** Optimized for application servers with supporting storage and networking—is designed to support your key ISV solutions.
- **IBM PureFlex System Enterprise:** Optimized for transactional and database systems—has built-in redundancy for highly reliable and resilient operation to support your most critical workloads.

Let's take a quick look at each.





MORE ON THE WEB

- [Redbook: IBM PureFlex and Flex System Products & Technology](#)

PureFlex Express

The IBM PureFlex System Express ([Figure F.1](#)) combines advanced IBM hardware and software along with patterns of expertise and integrates them into an optimized configuration that is simple to acquire and deploy so you get fast time to value for your solution.

The PureFlex System Express configuration is designed for small and medium businesses and is the most affordable PureFlex System entry point.

Here are some quick PureFlex Express facts:

- Integration by design: deeply integrated compute, storage, and networking resources so you can deploy in hours instead of days
- Built-in expertise: automated management and deployment expertise for physical and virtual resources so your experts can focus on innovation
- Simplified experience: optimized configurations to accelerate purchase, deployment, and time to value for your solution.

PureFlex Standard

The IBM PureFlex System Standard ([Figure F.2](#)) combines advanced IBM hardware and software along with patterns of

**Specifications**

IBM Flex System Compute Nodes	Broad selection of POWER-processor and Intel-processor compute nodes
IBM PureFlex System 42U Rack	Yes
IBM Flex System Enterprise Chassis	Yes
Integrated 10 Gb Networking Switch	1
Integrated 8 Gb or 16 Gb Fibre Channel Switch	1
IBM Flex System Manager	Yes, with 1-year service and support
Power supplies (std/max)	2/6
80 mm fans (std/max)	4/8
Chassis Management Modules	2
Integrated IBM Flex System V7000 Storage Node	Yes (redundant controller) Node
IBM Flex System V7000 Storage Node Software	Base with 1-year software maintenance agreement
IBM PureFlex System Services	9x5 hardware warranty with one microcode analysis services annually

- [PureFlex System Express details on PartnerWorld](#)
- [PureFlex System Express info on IBM.com](#)
- [PureFlex System Express competitive info on COMP](#)
- [PureFlex System build-to-order configurations](#)
- [PureFlex HW/SW compatibility](#)
- [PureFlex System Express blog search](#)
- [PureFlex System Express Twitter search](#)

Figure F.1. IBM PureFlex System Express at a glance (and links to more detail).



Specifications

IBM Flex System Compute Nodes	Broad selection of POWER-processor and Intel-processor compute nodes
IBM PureFlex System 42U Rack	Yes
IBM PureFlex System Enterprise Chassis	Yes
Integrated 10 Gb Networking Switch	1
Integrated 8 or 16 Gb Fibre Channel Switch	2
IBM Flex System Manager	Yes, including Advanced Option with 3-year service and support
Power supplies (std/max)	4/6
80 mm fans (std/max)	6/8
Chassis Management Modules	2
Integrated IBM Flex System V7000 Storage Node	Yes (redundant controller)
IBM Flex System V7000 Storage Node Software	Base with 3-year software maintenance agreement
IBM PureFlex System Services	24x7 technical support with one microcode analysis annually, and 9x5 account advocate services

- [PureFlex System Standard details on PartnerWorld](#)
- [PureFlex System Standard info on IBM.com](#)
- [PureFlex System Standard competitive info on COMP](#)
- [PureFlex System build-to-order configurations](#)
- [PureFlex HW/SW compatibility](#)
- [PureFlex System Standard blog search](#)
- [PureFlex System Standard Twitter search](#)

Figure F.2. IBM PureFlex System Standard at a glance (and links to more detail).



expertise and integrates them into an optimized configuration that is simple to acquire and deploy so you get fast time to value for your solution.

The PureFlex System Standard configuration is optimized for application servers with supporting storage and networking and is designed to support your key ISV solutions.

Here are some quick PureFlex Standard facts:

- Integration by design: deeply integrated compute, storage, and networking resources so you can deploy in hours instead of days
- Built-in expertise: automated management and deployment expertise for physical and virtual resources so your experts can focus on innovation
- Simplified experience: optimized configurations to accelerate purchase, deployment, and time to value for your solution.

PureFlex Enterprise

The IBM PureFlex System Standard ([Figure F.3](#)) combines advanced IBM hardware and software along with patterns of expertise and integrates them into an optimized configuration that is simple to acquire and deploy so you get fast time to value for your solution.

The Enterprise configuration is optimized for scalable cloud deployments and has built-in redundancy for highly reliable and resilient operation to support your critical applications and cloud services.



Specifications

IBM Flex System Compute Nodes	Broad selection of POWER-processor and Intel-processor compute nodes
IBM PureFlex System 42U Rack	Yes
IBM PureFlex System Enterprise Chassis	Yes
Integrated 10 Gb Networking Switch	2 with choice of FOD upgrades for more ports and higher performance
Integrated 8 or 16 Gb Fibre Channel Switch	2
IBM Flex System Manager	Yes, including Advanced Option with 3-year service and support
Power supplies (std/max)	6/6
80 mm fans (std/max)	8/8
Chassis Management Modules	2
Integrated IBM Flex System V7000 Storage Node	Yes (redundant controller)
IBM Flex System V7000 Storage Node Software	Base with 3-year software maintenance agreement
IBM PureFlex System Services	24x7 technical support with one microcode analysis annually, and 9x5 account advocate services

- [PureFlex System Enterprise details on PartnerWorld](#)
- [PureFlex System Enterprise info on IBM.com](#)
- [PureFlex System Enterprise competitive info on COMP](#)
- [PureFlex System build-to-order configurations](#)
- [PureFlex HW/SW compatibility](#)
- [PureFlex System Enterprise blog search](#)
- [PureFlex System Enterprise Twitter search](#)

Figure F.3. IBM PureFlex System Enterprise at a glance (and links to more detail).



Here are some quick PureFlex Enterprise facts:

- Integration by design: deeply integrated compute, storage, and networking resources so you can deploy in hours instead of days
- Built-in expertise: automated management and deployment expertise for physical and virtual resources so your experts can focus on innovation
- Simplified experience: optimized configurations to accelerate purchase, deployment, and time to value for your solution.

PureApplication System

As mentioned in Chapter 1, IBM PureApplication System is a platform system that pre-integrates middleware and expertise with the IBM PureFlex System.

At a high level there are two kinds of expertise in the IBM PureApplication System:

1. Embedded expertise, as the system contains a balanced amount of compute, storage, and network for workloads it is designed for.
2. Application and platform patterns for a particular type of application or workload, i.e., the PureApplication System has a “web app” pattern that allows client applications to utilize the pattern for rapid deployment, automated scaling, or improved operations and management.

PureApplication patterns of expertise can automatically balance, manage, and optimize necessary elements, from the



underlying hardware resources up through the middleware and software. These patterns of expertise help deliver and manage business processes, services, and applications by encapsulating best practices and expertise into a repeatable and deployable form. This best-practice knowledge and expertise has been gained from decades of optimizing the deployment and management of data centers, software infrastructures, and applications around the world.

These patterns help you achieve the following types of value:

- **Agility:** As you seek to innovate to bring products and services to market faster, you need fast time-to-value. Expertise built into a solution can eliminate manual steps, automate delivery, and support innovation.
- **Efficiency:** To reduce costs and conserve valuable resources, you must get the most out of your systems with energy efficiency, simple management, and a fast, automated response to problems. With built-in expertise, you can optimize your critical business applications and get the most out of your investments.
- **Increased simplicity:** You need a less complex environment. Patterns of expertise can help you easily consolidate diverse servers, storage, and applications on to an easier-to-manage, integrated system.
- **Control:** With optimized patterns of expertise, you can accelerate cloud implementations to lower risk by improving security and reducing human error.



Streamline Administration and Maintenance with a Single Management Console: PureApplication management is integrated across the entire solution stack of hardware and software. This integrated approach provides a single point of management with roles-based security and tasks, real-time system monitoring, and application centric infrastructure and middleware provisioning.

MORE ON THE WEB

- [IBM PureSystems Centre](#)

IBM PureApplication System is available in four configurations ([Figure A.1](#)). These configuration options enable you to choose the size and compute power that meet your needs for application infrastructure. You can upgrade to the next size when your organization requires more capacity, and in most cases you can do so without any application downtime.

Leverage extensibility from a broad, open ecosystem of partners ready and able to provide industry expertise and solutions to clients. Take advantage of PureSystems Centre—a PureSystems catalog and solution showcase that simplifies deployment of partner applications—to deliver value even faster.

	IBM PureApplication System W1500-96	IBM PureApplication System W1500-192	IBM PureApplication System W1500-384	IBM PureApplication System W1500-608
Cores	96	192	384	608
RAM	1.5 TB	3.1 TB	6.1 TB	9.7 TB
SSD Storage	6.4 TB	6.4 TB	6.4 TB	6.4 TB
HDD Storage	48.0 TB	48.0 TB	48.0 TB	48.0 TB
Application Services Entitlement	Included	Included	Included	Included

Figure A.1. IBM PureApplication System configurations at a glance.



There you can:

- Gain access to a broad community of IBM and certified partner expertise
- Download optimized, deployable application patterns from 100+ leading ISV partners
- Search by solution area, industry, or system
- Download fixes and patches
- Access a developer community.

PureApplication System is built for cloud and has a complete set of private cloud platform-as-a-service (PaaS) capabilities. Not only does PureApplication provide cloud infrastructure as a service via foundational capabilities, but it's the first fully integrated PaaS box in the industry. Following is a summary list of the key characteristics of a cloud environment, all of which are built into the PureApplication System:

- Dynamic resource scalability
- Highly standardized infrastructure
- Multi-tenancy
- Virtualization
- Automated provisioning of IT resources
- Catalog of services
- User-based self-service
- Service level management
- Usage-based reporting.



PureData System

As described in Chapter 1, the new IBM PureData System is optimized exclusively for delivering data services to today's demanding applications. Like each of the IBM PureSystems, it offers built-in expertise, integration by design, and a simplified experience throughout its life cycle.

MORE ON THE WEB

- [PureData System info on IBM.com](#)

The new PureData System comes in different models that have been designed, integrated, and optimized to deliver data services to today's demanding applications with simplicity, speed, and lower cost. Let's take a closer look at PureData System models optimized for transactions, analytics, and operational analytics.

PureData System for Transactions

The IBM PureData System for Transactions—part of the IBM PureSystems family—is a highly reliable and scalable database platform designed to help reduce complexity, accelerate time to value, and lower ongoing data management costs. The system

MORE ON THE WEB

- [PureData System for Transactions info on IBM.com](#)

enables IT departments to easily deploy, optimize, and manage transactional database workloads. This expert integrated system sets a new standard in workload-optimized systems, delivering value with:



- Built-in database management expertise that enables the system to do many of the ongoing administration tasks automatically, freeing up database staff from routine work
- Integration by design that results in factory-optimized systems designed for high reliability and scalability out of the box, streamlining system integration efforts
- A simplified experience from design to purchase to maintenance, which helps reduce total cost of operations.

The PureData System for Transactions represents the future of data services delivery and management. It combines the simplicity of a workload-optimized appliance with the flexibility of tailor-made systems, providing both fast time-to-value and customization to meet specific business needs.

PureData System for Analytics

On a smarter planet, the need to analyze large volumes of data to find patterns and drive insights becomes critical. This requires systems that are optimized to deal with vast amounts of data and complex analytic processing.

MORE ON THE WEB

- [PureData System for Analytics info on IBM.com](#)

The PureData System for Analytics, powered by Netezza technology, is a simple data appliance for serious analytics. It simplifies and optimizes performance of data services for analytic applications, enabling very complex algorithms to run in minutes, not days, delivering:

- Built-in expertise



- Netezza technology that is designed to expertly manage database workloads and uses field-programmable gate arrays (FPGA) for high-performance processing of analytics
- More than 200 in-database analytics functions, which support analysis where the data resides to eliminate costly data movement, yielding industry-leading performance while hiding the complexity of parallel programming
- Built-in Predictive Model Markup Language (PMML) 4 support, which enables prediction and scoring within the database
- In-database geospatial analytics, which correlate transactional information to a location, enhancing applications such as fraud detection and supply chain optimization
- Integration by design
 - Hardware and software capabilities specifically designed, integrated, and tuned for high performance analytics
 - Patented data filtering with programmable hardware for ultrafast execution of complex queries—without the need to maintain indices, aggregates, or partitioning
 - An innovative, asymmetric, massively parallel processing architecture that supports petabyte scale
- A simplified experience
 - No assembly required—ready to load data in hours
 - Simplified integration with third party software
 - Single integrated management console



- Single line of support
- Integrated system fixes and upgrades.

PureSystem for Operational Analytics

IBM PureData System for Operational Analytics—part of the IBM PureSystems family—is an expert integrated data system that is designed and optimized specifically for the demands of an operational analytics workload.

MORE ON THE WEB

- [PureData System for Operational Analytics info on IBM.com](#)

The system

is a complete, out-of-the-box solution for operational analytics that provides both the simplicity of an appliance and the flexibility of a custom solution. Designed to handle 1000+ concurrent operational queries, it delivers mission-critical reliability, scalability, and outstanding performance.

This PureData System enables IT departments to easily deploy, optimize, and manage data-intensive workloads for operational analytics. It delivers exceptional value in three ways:

- Built-in operational analytics expertise, based on IBM’s years of experience and best practices from thousands of client engagements, is embedded into the system to provide a complete solution that can deliver value out-of-the-box.
- Integration by design of software, server, storage, and networking results in factory-optimized systems designed for fast time-to-value, efficiencies, and high performance.



- A simplified experience from design to purchase to maintenance helps reduce total cost of operations.

Flex System Building Blocks

The fundamental building block of IBM PureSystem solutions is the IBM Flex System Enterprise Chassis, complete with compute nodes, networking, and storage. In this section, we look at the components used in IBM PureSystems.

MORE ON THE WEB

- [Flex System info on IBM.com](#)
- [Flex System Information Center](#)
- [Product guides about the components of IBM Flex System](#)

Flex System Enterprise Chassis

The IBM Flex System Enterprise Chassis ([Figure C.1](#)) provides a high-performance, integrated infrastructure platform that supports a mix of compute, storage, and networking resources to meet the demands of your applications. Available on either your IBM PureFlex System or IBM Flex System, the solution is easily scalable with the addition of another chassis with the required nodes. With the IBM Flex System Manager, multiple chassis can be managed from a single console. The 14 node, 10U chassis delivers high-speed performance complete with integrated servers, storage, and networking. This flexible chassis is designed to deploy easily now and to scale to meet your needs in the future.



- [Enterprise Chassis details on PartnerWorld](#)
- [Enterprise Chassis details on IBM.com](#)
- [Enterprise Chassis competitive info on COMP](#)
- [Enterprise Chassis configuration details](#)
- [Enterprise Chassis options](#)
- [Enterprise Chassis blog search](#)
- [Enterprise Chassis Twitter search](#)

Figure C.1. IBM Flex System Enterprise Chassis (and links to more detail).

The 14 bays in the chassis allow installation of compute, storage, and management nodes, with networking modules in the rear. A single chassis or a group of chassis can be fully customized to the specific needs of the computing environment. With support for POWER7, POWER7+, and Intel processor-based nodes in standard or double-width form factors, you can choose the architecture you need to run your business. IT can meet the needs of the business using a single platform across multiple architectures and operating environments.



Here are some quick IBM PureFlex Enterprise System facts:

- High-performance platform for the next generation of IT
- No compromise design that can scale capability with the business needs
- Allows choice of compute, storage, networking, and management nodes.

Compute Nodes

Taking advantage of the full capabilities of IBM Power and Intel processors, the compute nodes are designed to offer the performance you need for your critical applications. With support for a range of hypervisors, operating systems, and virtualization environments, the compute nodes provide the foundation for:

- Virtualization solutions
- Database applications
- Infrastructure support
- Line of business applications.

In this section, we will explore the different compute nodes available.

x86 Compute Nodes

In this section, we take a look at the IBM Flex System compute nodes that leverage the x86 family of processors.



Flex System x220 Compute Node

The IBM Flex System x220 compute node ([Figure N.1](#)) has a versatile, cost-optimized design for infrastructure and entry virtualization workloads. The Flex System x220 compute node is available in either the PureFlex System or IBM Flex System solutions.

With Flex System x220 compute node, it is simpler than ever to get started. The Flex System x220 compute node features a no-compromise design for processor, memory, and networking resources to allow your business to do more. Automated power management with onboard sensors gives you more control over power and thermal levels across the system. These capabilities, combined with memory capacity up to 192 GB, are designed to help you get the most out of your systems.

Upgrading to 10 Gigabit Ethernet (GbE) Virtual Fabric allows you to take advantage of up to 32 ports of virtual networking capabilities and leverage multiple protocols, including Ethernet, Fibre Channel over Ethernet, and iSCSI. The system also allows you to enable features on demand for a more flexible I/O solution. Virtual networking can require up to 75 percent fewer adapters, cables, and upstream switch ports to help control costs. You also get significantly simpler management with reduced cabling and fewer components to manage.

Built-in storage is available through two 2.5-inch hot swap hard drives or solid state drives. Available optional features include support for RAID 0, 1, 5, 6, 10, and 50 fully backed by cache and a high-density application acceleration solution with IBM Flex System Flash. These features allow you to tailor

**Specifications**

Processor	2/2, Intel Xeon E5-2400 Series Processor
Level 2 (L2) cache	256 KB per core
Level 3 (L3) cache	2C—5 MB, 4C—10 MB, 6C—15 MB, 8C—20 MB
Chipset	Intel C600
Form factor	Flex System standard node
Memory	12 DDR3/DDR3L LP, 192 GB max with 16 GB RDIMMs
Internal storage	2 x HS 2.5" (SAS/SATA/SSD)
Internal RAID	SW RAID, RAID 0/1—Optional HW RAID, ServeRAID H1135, RAID 0/1; Optional ServeRAID M5115/RAID 0, 1, 5, 6, 10, 50 with LSI SAS2208 Controller
Internal USB	2 x Standard USB Flash Key; 1 x Front Access USB Key
Ethernet	Broadcom Dual 1 GbE
Chassis support	Flex System Enterprise Chassis
I/O expansion	2 x Mezz Cards (x8 + x4) + x4 PCI Express 3.0 1 x PCIe Expansion Node Connector (x16 PCI Express 3.0)
Power management	AEM, Active Energy Management
Management	iMM V2, RTMM KVM Dongle
RAS features	Chassis redundant/hot plug power & cooling; front panel & FRU/CRU LEDs
Operating systems	MS Windows Server, SUSE, RedHat Enterprise Linux, VMware
Warranty	3 year

- [x220 details on PartnerWorld](#)
- [x220 details on IBM.com](#)
- [x220 competitive info on COMP](#)
- [x220 configuration details](#)
- [x220 options](#)
- [x220 blog search](#)
- [x220 Twitter search](#)

Figure N.1. IBM Flex System x220 Compute Node at a glance (and links to more detail).



internal storage to match your specific capacity, performance, and reliability needs and support applications such as distributed database without sacrificing system density.

Here are some quick x220 facts:

- Optimized for infrastructure and entry virtualization workloads
- Simple virtualization solution with embedded dual hypervisors
- Designed for simplified deployment and management.

Flex System x240 Compute Node

IBM Flex System x240 Compute Node ([Figure N.2](#)) is optimized for virtualization, performance, and highly scalable I/O designed to run a wide variety of workloads. The Flex System x240 is available on either the PureFlex System or IBM Flex System solution.

The Flex System x240 compute node delivers maximum performance—up to 80 percent performance boost over previous generation servers. This enables businesses to get more out of their compute environment for a broad set of workloads. Features such as automated power management with onboard sensors give you more control over power and thermal levels across the system. Offering up to 50 percent more performance per watt than previous generations, the new Flex System x240 compute node is designed to improve energy efficiency. These capabilities, combined with memory capacity up to 768 GB, help you get the most out of your compute environment.

**Specifications**

Processor	2/2, Intel Xeon E5-2600 Series Processor
Level 2 (L2) cache	256 KB per core
Level 3 (L3) cache	2C—5 MB, 4C—10 MB, 6C—15 MB, 8C—20 MB
Chipset	Intel C600
Form factor	Flex System standard node
Memory	24 DDR3/DDR3L LP, 768 GB max with 32 GB LRDIMM
Internal storage	2 x HS 2.5" (SAS/SATA/SSD)
Internal RAID	LSI 2004, RAID 0/1 Optional ServeRAID M5115/RAID 0, 1, 5, 6, 10, 50 with LSI SAS2208 Controller
Internal USB	2 x Standard USB Flash Key; 1 x Front Access USB Key
Ethernet	IBM Virtual Fabric 2 x 10 GbE LOM
Chassis support	Flex System Enterprise Chassis
I/O expansion	2 x Mezz Cards (x16 + x8 PCI Express 3.0) 1 x PCIe Expansion Node Connector (x16 PCI Express 3.0)
Power management	AEM, Active Energy Management
Management	iMM V2, RTMM KVM Dongle
RAS features	Chassis redundant/hot plug power & cooling; Front panel & FRU/CRU LEDs
Operating systems	MS Windows Server, SUSE, RedHat Enterprise Linux, VMware
Warranty	3 year

- [x240 details on PartnerWorld](#)
- [x240 details on IBM.com](#)
- [x240 competitive info on COMP](#)
- [x240 configuration details](#)
- [x240 options](#)
- [x240 blog search](#)
- [x240 Twitter search](#)

Figure N.2. IBM Flex System x440 Compute Node at a glance (and links to more detail).



With integrated virtual fabric, you can take advantage of up to 32 ports of virtual networking capabilities. With 10 Gigabit Ethernet (GbE) onboard, you get multiple protocols, including Ethernet, Fibre Channel over Ethernet, and iSCSI. The system also allows you to enable features on demand for a more flexible I/O solution. Virtual networking can reduce up to 75 percent of adapters, cables, and upstream switch ports to help control costs. In addition, you also get significantly simpler management with reduced cabling and fewer components to manage.

Built-in storage is available with 2.5-inch hot swap hard drives or solid state drives. Available optional features include support for RAID 0, 1, 5, 6, 10, and 50 fully backed by cache and a high-density application acceleration solution with IBM Flex System Flash. These features allow you to tailor internal storage to match your specific capacity, performance, and reliability needs and support applications such as distributed database without sacrificing system density.

Here are some quick x240 facts:

- Optimized for virtualization, performance, and highly scalable networking
- Embedded IBM Virtual Fabric allows breakthrough I/O flexibility
- Designed for simplified deployment and management.

Flex System x440 Compute Node

The IBM Flex System x440 Compute Node ([Figure N.3](#)) is optimized for high-end virtualization, mainstream database

**Specifications**

Processor	4/4, Intel Xeon E5-4600 Series Processor
Level 2 (L2) cache	256 KB per core
Level 3 (L3) cache	4C—10 MB, 6C—15 MB, 8C—20 MB
Chipset	Intel C600
Form factor	Flex System standard node
Memory	48 DDR3/DDR3L LP, 1.5 TB (32 GB LRDIMMs)
Internal storage	2 x HS 2.5" (SAS/SATA/SSD)
Internal RAID	LSI 2004, RAID 0/1 Optional ServeRAID M5115/RAID 0, 1, 5, 6, 10, 50
Internal USB	2 x Standard USB Flash Key; 1 x Front Access USB Key
Ethernet	Two IBM Virtual Fabric (2x10 GbE) LOMs, total of 4x10 GbE ports, LOM-less models available
Chassis support	Flex System Enterprise Chassis
I/O expansion	4 x Mezz Cards (x16 + x8 PCI Express 3.0)
Power management	AEM, Active Energy Management
Management	iMM V2, RTMM KVM Dongle
RAS features	Chassis redundant/hot plug power & cooling; Front panel & FRU/CRU LEDs
Operating systems	MS Windows Server, SUSE, RedHat Enterprise Linux, VMware
Warranty	3 year

- [x440 details on PartnerWorld](#)
- [x440 details on IBM.com](#)
- [x440 competitive info on COMP](#)
- [x440 configuration details](#)
- [x440 options](#)
- [x440 blog search](#)
- [x440 Twitter search](#)

Figure N.3. IBM Flex System x440 Compute Node at a glance (and links to more detail).



deployments, and memory-intensive high performance environments. The Flex System x440 compute node is a price-performance optimized 4-socket compute node with flexible I/O options to help you match system capabilities to workloads without compromise. With a dense design, the Flex System x440 compute node can help reduce floor space used and lower data center power and cooling costs. The Flex System x440 is available on either the PureFlex System or IBM Flex System solution.

The Flex System x440 compute node is performance-tuned and features no compromise compute, memory, and I/O capacity to meet your needs. It is designed to deliver an outstanding combination of performance, built-in capabilities, and cost-effectiveness, featuring automated power management with onboard sensors to give you more control over power and thermal levels across the system. Combined with memory capacity up to 1.5 TB, the Flex System x440 compute node is designed to help you get the most out of your systems.

With integrated virtual fabric you can take advantage of up to 64 virtual network adapters while making use of multiple protocols, including Ethernet, Fibre Channel over Ethernet, and iSCSI. The system also allows you to enable features on demand for a more flexible I/O solution. Virtual fabric can require up to 75 percent fewer network adapters, cables, and upstream switch ports to help control costs. You also get significantly simpler management with reduced cabling and fewer components to manage.

Built-in storage is available through two 2.5-inch hot swap hard drives or solid state drives. Available optional features



include support for RAID 0, 1, 5, 6, 10, and 50 fully backed by cache and a high-density application acceleration solution with IBM Flex System Flash. These features allow you to tailor internal storage to match your specific capacity, performance, and reliability needs and support distributed database applications without sacrificing system density.

Here are some quick x440 facts:

- Optimized for high-end virtualization and mainstream databases
- No compromise design with available 1.5 TB memory capacity and up to 64 virtual network adapters
- Designed for simplified deployment and management.

Power Compute Nodes

In this section, we explore the IBM Flex System compute nodes built using the IBM POWER microprocessor family.

p24L Compute Node (PowerLinux)

IBM Flex System p24L Compute Node ([Figure N.4](#)) is a POWER7-based server optimized for virtualization, performance, and extraordinary efficiency. The node supports Linux operating environments and is designed to run a wide variety of workloads in your PureFlex System.

The IBM Flex System p24L compute node delivers the outstanding performance of the IBM POWER7 processor in a dense, highly efficient form factor for Linux customers. It is ideal for running multiple Linux infrastructure and application workloads, virtualized with PowerVM, more economically than



Specifications

Form factor	Flex System standard node
Processor cores	8 or 16 64-bit POWER7 cores with AltiVec SIMD and Hardware Decimal Floating-Point acceleration Configuration options: 6-core 3.7 GHz or 8-core 3.2 GHz or Eight-core 3.5 GHz
Level 2 (L2) cache	256 KB per processor core
Level 3 (L3) cache	4 MB per processor core
Memory (min/max)	8 GB up to 256 GB, 16 DIMM slots, ECC IBM Chipkill DDR3 SDRAM running at 1066 MHz
Internal disk storage	Up to 2 2.5 in. hard disks or 2 1.8 in. SSDs
Networking/expansion	2 PCI-E expansion slots
Systems management	Integrated systems management processor, light path diagnostics, Predictive Failure Analysis (PFA), Cluster Systems Management (CSM), serial over local area network (LAN), Intelligent Platform Management Interface (IPMI) compliant
RAS features	Chassis redundant/hot plug power & cooling; front panel and field-replaceable unit (FRU)/customer replaceable unit (CRU) light emitting diodes (LEDs); concurrent code update; processor deallocation; ITE hot plug; dual AC; power supply; auto reboot on power loss; Internal and chassis-external temperature monitors; 64 byte (B) marking ECC code supporting eight times IS DDR3 DIMMs; system mgmt alerts; IBM Chipkill ECC detection and correction
Operating systems	Red Hat Enterprise Linux 5.7, 6.2 SUSE Linux Enterprise Server (SLES)11 SP2
Energy management	EnergyScale energy management

- [p24L details on PartnerWorld](#)
- [p24L details on IBM.com](#)
- [p24L competitive info on COMP](#)
- [p24L blog search](#)
- [p24L Twitter search](#)

Figure N.4. IBM Flex System p24L Compute Node at a glance (and links to more detail).



traditional Linux servers. Take advantage of the IBM Flex System p24L's scalability and capacity by leveraging IBM's feature rich PowerVM virtualization technology to fully utilize the server's capacity and deploy virtual partitions faster as well as move workloads as needed across IBM PowerLinux and Power Systems servers with Live Partition Mobility (LPM).

Here are some quick p24L facts:

- Integration by design: compute nodes are deeply integrated with storage, networking, and management resources so your solution deploys quickly and is easy to manage
- Built-in expertise: engineering expertise allows you to extract the full capability of the IBM POWER7 processor
- Simplified experience: systems management can automatically discover the node for simple configuration and quick deployment.

p260-p460 Compute Nodes

IBM Flex System p260 and p460 Compute Nodes ([Figure N.5](#)) are POWER7 and POWER7+-based servers optimized for virtualization, performance, and extraordinary efficiency. The nodes support IBM AIX, IBM i, or Linux operating environments and are designed to run a wide variety of workloads in your PureFlex System or IBM Flex System solution.

Built in storage capabilities on the compute nodes include up to two 2.5-inch support small form factor hard drives or up to two 1.8-inch solid state drives. The nodes can also access storage attached through the network and managed with IBM Flex System Manager. Networking options include 1 Gb



Specifications

Form factor	Flex System standard node
Processor cores	8 or 16 cores, POWER7 64-bit processors with AltiVec SIMD and Hardware Decimal Floating-Point acceleration 8 or 16 cores, POWER7+, 64-bit processors with VSX, Memory Expansion acceleration and Encryption acceleration Configuration Options: 4-core 3.3 GHz or 4.0 GHz 8-core 3.2 GHz or 3.6 GHz 8-core 3.5 GHz or 4.1 GHz
Level 2 (L2) cache	256 KB per processor core
Level 3 (L3) cache	4 MB per processor core on 3.3, 3.2, and 3.5 GHz offerings 10 MB per processor core on 3.6, 4.0, and 4.1 GHz offerings
Memory (min/max)	8 GB up to 512 GB, 16 DIMM slots, ECC IBM Chipkill DDR3 SDRAM running at 1066 MHz
Internal disk storage	Up to 2 2.5" hard disks or 2 1.8" SSDs
Networking/expansion	2 PCI-E expansion slots
Systems management	Integrated systems management processor, light path diagnostics, Predictive Failure Analysis, Cluster Systems Management (CSM), Serial Over LAN, IPMI compliant
RAS features	Chassis redundant / hot plug Power & Cooling; Front Panel & FRU/CRU LEDs Concurrent code update; Processor deallocation; ITE hot plug; Dual AC Power Supply; Auto reboot on power loss; Internal and chassis-external temperature monitors; 64B Marking ECC code supporting x8 IS DDR3 DIMMs System mgmt alerts; IBM Chipkill ECC detection and correction
Operating systems	AIX 6.1, 7.1; IBM i 6.1 and 7.1; RHEL 5.7, 6.2, SLES 11 SP2
Energy management	EnergyScale energy management

- [p260 details on PartnerWorld](#)
- [p460 details on PartnerWorld](#)
- [p260 and p460 details on IBM.com](#)
- [p260 competitive info on COMP](#)
- [p460 competitive info on COMP](#)
- [p260 blog search](#)
- [p460 blog search](#)
- [p260 Twitter search](#)
- [p460 Twitter search](#)

Figure N.5. IBM Flex System p260 and p460 Compute Nodes at a glance (and links to more detail).



or 10 Gb Ethernet expansion, 8 Gb and 16 Gb Fibre Channel expansion, and FCOE for connection to external storage and networks. These features allow you to tailor your environment to match your specific capacity, performance, cost, and reliability needs and also support virtualized storage for Cloud computing applications.

Here are some quick p260 and p460 facts:

- POWER7+ technology brings faster frequencies and larger L3 cache sizes, which helps improve performance by over 20 percent on most workloads, and hardware assisted memory compression helps reduce memory requirements without penalizing performance
- Simplified experience: systems management can automatically discover the node for simple configuration and quick deployment
- IBM provides the integration and configuration expertise up front so you can get your system deployed faster and get faster time to value.

Expansion Nodes

In this section, we examine the expansion nodes used to add capacity and capabilities to IBM Flex System configurations.

PCI Expansion Node

The IBM Flex System PCIe Expansion Node ([Figure N.6](#)) is an element of the IBM PureFlex System family which combines compute, storage, networking, virtualization, and manage-



Specifications

Supported bus widths	1x, 2x, 4x, 8x, and 16x
Adapter capacity	Two full-length, full-height x16 Two half-length, half-height x8
Adapter sizes	Standard-height adapters, 4.20-inch (106.7 mm) Low-profile adapters, 2.536-inch (64.4 mm) Half-length adapters, 6.6-inch (167.65 mm) Full-length adapters, 12.283-inch (312 mm)
Adapter quantities	Up to two low-profile adapters Up to two full-height adapters Up to one full-height, doublewide adapters
PCIe standards	Supports 1.1 and 2.0
Generation	Generation 1- and Generation 2-compliant adapters
Power	Supports greater than 75 W PCIe adapters using standard PCIe auxiliary power connectors
Form factor	Flex System standard node
I/O Expansion	2X Mezz adapters (x8+x4)
Management	iMM V2, RTMM KVM Dongle
Warranty	3-year customer replaceable unit and on-site service, next business day 9x5, service upgrades available

- [PCIe Expansion Node info on PartnerWorld](#)
- [PCIe Expansion Node info on IBM.com](#)
- [PCIe Expansion Node info on COMP](#)
- [PCIe Expansion Node blog search](#)
- [PCIe Expansion Node Twitter search](#)

Figure N.6. IBM Flex System PCIe Expansion Node at a glance (and links to more detail).



ment into a single system that anticipates resource needs to help you optimize your infrastructure. The PCIe Expansion Node allows you to attach additional PCI express adapters, fabric mezzanine adapters, and next-generation graphics processing units (GPU) to an IBM Flex System compute node, which expands the compute node's capability.

Here are some quick PCI Expansion Node facts:

- Expands the capability of IBM Flex System compute nodes
- Offers dedicated attachment for select standard PCIe adapters, fabric mezzanine adapters, and next-generation graphics processing units
- Works in a variety of network and application environments.

Storage Expansion Node

The IBM Flex System Storage Expansion Node ([Figure N.7](#)) is an element of the IBM Flex System family and the IBM PureFlex System family that combines compute, storage, networking, virtualization, and management into a single system that anticipates resource needs to help you optimize your infrastructure. The IBM Flex System Storage Expansion Node provides dedicated hard disk drives (HDDs) or solid state disk (SSD) storage to an IBM Flex System x220 and x240 compute node, which expands the compute node's capability.

Here are some quick Storage Expansion Node facts:

- Expands the capability of IBM Flex System compute nodes
- Easily add dedicated storage capacity for Network Attach Storage workloads



Specifications

Feature on Demand	ServeRAID M5100 Series RAID 6 Upgrade ServeRAID M5100 Series SSD Caching Enabler ServeRAID M5100 Series Performance Accelerator
HDD support	SAS 2.1 at 6 Gbps and SATA
PCIe support	x8 PCIe Gen 3, 8 Gbps
Drive modes	JBOD and RAID
RAID modes	RAID-0, 1, 5, 6, 10, 50 and 60
Cache options	512 MB and 1 GB with cache-to-flash super capacitor offload
Form factor	Flex System standard node
Chassis support	Flex System Enterprise Chassis
Systems management	iMM V2, RTMM KVM Dongle
Warranty	3-year customer replaceable unit and onsite limited warranty, next business day 9x5, service upgrades available

- [Storage Expansion Node info on PartnerWorld](#)
- [Storage Expansion Node info on IBM.com](#)
- [Storage Expansion Node info on COMP](#)
- [Storage Expansion Node blog search](#)
- [Storage Expansion Node Twitter search](#)

Figure N.7. IBM Flex System Storage Expansion Node at a glance (and links to more detail).



- Flexible storage to match your capacity, performance, and reliability needs.

Storage

The storage capabilities of IBM Flex System allow you to gain advanced functionality with storage nodes in your system while taking advantage of your existing storage infrastructure through advanced virtualization.

IBM Flex System simplifies storage administration with a single user interface for all your storage with a management console that is integrated with the comprehensive management system. These management and storage capabilities allow you to virtualize third-party storage with non-disruptive migration of the current storage infrastructure. You can also take advantage of intelligent tiering so you can balance performance and cost for your storage needs. The solution also supports local and remote replication and snapshots for flexible business continuity and disaster recovery capabilities.

In this section, we will take a look at the storage devices used with IBM Flex System.

V7000 Storage Node

IBM Flex System V7000 Storage Node ([Figure S.1](#)) is a powerful block storage system designed to enable exceptionally rapid storage deployment and breakthrough management simplicity through integration with IBM compute, storage, networking, virtualization, and management infrastructures.

PureFlex System and IBM Flex System represent a new category of computing that integrates multiple server ar-



Specifications

Host interface	SAN-attached 8 Gbps Fibre Channel, 10 Gigabit Ethernet (GbE) Fibre Channel over Ethernet, and iSCSI host connectivity
Cache per controller/control enclosure/clustered system	8 GB/16 GB/64 GB
Supported drives	2.5" disk drives: <ul style="list-style-type: none"> • 500 GB, 1 TB 7.2k nearline SAS • 146 and 300 GB 15k SAS • 300, 600 and 900 GB 10k SAS • 200 and 400 GB E-MLC SSD
Maximum drives supported	240 per control enclosure; 960 per clustered system
Chassis support	IBM Flex System Enterprise Chassis
Management software	IBM Flex System Manager
Advanced features included with each system	System Storage Easy Tier, IBM FlashCopy, internal virtualization and thin provisioning, data migration, system clustering
Optional features	Remote mirroring, Real-time Compression, external virtualization

- [V7000 Storage Node info on PartnerWorld](#)
- [V7000 Storage Node info on IBM.com](#)
- [V7000 Storage Node competitive info on COMP](#)
- [V7000 Storage Node blog search](#)
- [V7000 Storage Node Twitter search](#)

Figure S.1. IBM Flex System V7000 Storage Node at a glance (and links to more detail).



chitectures, networking, storage, and system management capabilities into a single system that is easy to deploy and manage. These new-generation integrated systems support open industry standards—such as operating systems, networking and storage fabrics, virtualization, and system management protocols—to easily fit within existing and future data center environments. PureFlex System and IBM Flex System solutions are scalable and extendable with multi-generation upgrades to protect and maximize IT investments.

Flex System V7000 Storage Node is built on the industry leading storage virtualization and efficiency capabilities of IBM Storwize V7000, while being integrated into PureFlex System or IBM Flex System solutions.

Here are some quick V7000 Storage Node facts:

- Automate and speed deployment with integrated storage for IBM PureFlex System or IBM Flex System
- Simplify management with an integrated, intuitive user interface for faster system accessibility
- Reduce network complexity with FCoE and iSCSI connectivity
- Store up to five times more active data in the same disk space using IBM Real-time Compression
- Virtualize third-party storage for investment protection of the current storage infrastructure
- Optimize costs for mixed workloads, with up to 200 percent better performance with solid-state drives (SSDs) using IBM System Storage Easy Tier.



Storwize V7000 Unified Disk System

IBM Storwize V7000 and Storwize V7000 Unified ([Figure S.2](#)) are virtualized storage systems to complement virtualized server environments that provide unmatched performance, availability, advanced functions, and highly-scalable capacity never seen before in midrange disk systems. As members of the IBM Storwize family, Storwize V7000 and Storwize V7000 Unified are powerful midrange disk systems that have been designed to be easy to use and to enable rapid deployment without additional resources. Storwize V7000 supports block workloads, whereas Storwize V7000 Unified consolidates block and file workloads into a single storage system for simplicity of management and reduced cost. Storwize V7000 and Storwize V7000 Unified are virtual storage systems that offer greater efficiency and flexibility through built-in SSD optimization and thin-provisioning technologies. Integrated IBM Real-time Compression enhances efficiency even further by enabling storing up to five times as much active primary data in the same physical disk space. Storwize V7000 and Storwize V7000 Unified advanced functions also enable non-disruptive migration of data from existing storage, simplifying implementation and minimizing disruption to users. Finally, these systems also enable you to virtualize and reuse existing disk systems, supporting a greater potential return on investment (ROI).

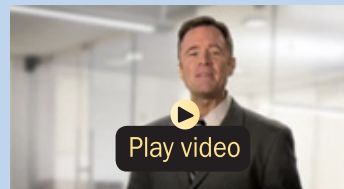
Here are some quick Storwize V7000 facts:

- Delivers sophisticated enterprise-class storage functionality for businesses

**Specifications**

Host interface	SAN-attached 8 Gbps Fiber Channel (FC), 1 Gbps iSCSI and optional 10 Gbps iSCSI/FCoE; NAS-attached 1 Gbps and 10 Gbps Ethernet
User interface	Graphical user interface (GUI)
Supported drives	<p>3.5" disk drives:</p> <ul style="list-style-type: none"> • 2 TB, 3 TB 7.2k Near-Line SAS disk <p>2.5" disk drives:</p> <ul style="list-style-type: none"> • 146 GB, 300 GB 15k SAS disk • 300 GB, 600 GB, 900 GB 10k SAS disk • 200 GB, 400 GB E-MLC E-MLC SSD • 1 TB 7.2k nearline SAS disk
RAID levels	RAID 0, 1, 5, 6 and 10
Maximum drives supported	240 per control enclosure; 960 per clustered system (Block only)
Fans and power supplies	Fully redundant, hot-swappable
Rack support	Standard 19" rack
Management software	Storwize V7000 and Storwize V7000 Unified Software
Cache per controller/ control enclosure/ clustered system	8 GB/16 GB/64 GB
Advanced features included with each system	System Storage Easy Tier, FlashCopy, thin provisioning, IBM Active Cloud Engine (Storwize V700 Unified only)
Additional available advanced features	Remote mirroring, external virtualization unified storage, FlashCopy Manager, IBM Tivoli Storage Productivity Center Select, Tivoli Storage Manager, IBM Tivoli Storage Manager FastBack, IBM Systems Director, Flex System Manager, IBM Real-time Compression

- [Storwize V7000 portal on PartnerWorld](#)
- [Storwize V7000 Express details on IBM.com](#)
- [Storwize V7000 competitive info on COMP](#)
- [Storwize V7000 blog search](#)
- [Storwize V7000 Twitter search](#)
- [FastBack for Storwize V7000](#)

*IBM Storwize V7000 overview (6:27)***Figure S.2.** IBM Storwize V7000 Midrange Disk System at a glance (and links to more detail).



- Supports your growing business requirements while controlling costs
- Provides up to 200 percent performance improvement with automatic migration to high-performing SSDs
- Enables storing up to five times more active data in the same physical disk space using IBM Real-time Compression
- Consolidates block and file storage for simplicity, greater efficiency, and ease of management
- Enables near-continuous availability of applications through dynamic migration.

System Networking

With a range of available adapters and switches to support key network protocols, you can configure IBM Flex System to fit in your infrastructure while still being ready for the future. The networking resources in IBM Flex System are standards-based, flexible, and fully integrated into the system, so you get no-compromise networking for your solution. Network resources are virtualized and managed by workload. These capabilities are automated and optimized to make your network more reliable and simpler to manage.

Key capabilities include:

- Support for the networking infrastructure that you have today, including Ethernet, Fibre Channel, and InfiniBand
- Plugs into your existing Cisco or Juniper network backbone



- Enables node-to-node communications without running through the top of rack (TOR) switch, reducing system latency
- Industry-leading performance with 1 Gb, 10 Gb, and 40 Gb Ethernet; 8 Gb and 16 Gb Fibre Channel and FDR InfiniBand
- Pay-as-you-grow scalability so you can add ports and bandwidth when needed.

Let's take a look at the system networking components used with IBM Flex System.

Ethernet

These high performance Ethernet offerings coupled with on demand scalability offer an easy way to scale as IT requirements grow. IBM Flex System Fabric is:

MORE ON THE WEB

- [Ethernet switches and adapters](#)

- Integrated—Helps manage discrete aspects of the data center as an integrated system through the built in management appliance.
- Optimized—High performance scalable offerings with available 1 Gb, 10 Gb, and 40 Gb uplinks allow easy integration with existing network; Simple and cost effective scalability for future growth
- Automated—Automate provisioning and setup of both physical and virtual network.

EN4093R 10 Gb Scalable Switch

The IBM Flex System Fabric EN4093R 10 Gb Scalable Switch ([Figure E.1](#)) provides unmatched scalability and performance,



- [10 Gb Scalable Switch details on PartnerWorld](#)
- [10 Gb Scalable Switch details on IBM.com](#)
- [10 Gb Scalable Switch competitive info on COMP](#)

Figure E.1. IBM Flex System Fabric EN4093 10 Gb Scalable Switch (and links to more detail).

while also delivering innovations to help address a number of networking concerns today and providing capabilities that will help you prepare for the future.

With the growth of virtualization and the evolution of cloud, many of today's applications require low latency and high bandwidth performance. The Flex System Fabric EN4093R is the first blade switch to support sub microsecond latency and up to 1.28 Tbps, while also delivering full line rate performance, making it ideal for managing dynamic workloads across your network. In addition, the switch provides a rich



Layer 2 and Layer 3 feature set that is ideal for many of today's data centers, plus offers industry-leading uplink bandwidth by being the first blade switch to support 40 Gb uplinks.

Here are some quick 10 Gb Scalable Switch facts:

- "Pay as you grow" scalability with the ability to turn on additional 10 Gb or 40 Gb ports
- Reduce cost and complexity via network convergence, stacking and Virtual Fabric
- Performance and low latency with 1.28 Tbps and less than 1 microsecond latency
- Investment protection when migrating from 1 Gb to 10 Gb and to a converged network
- Designed for FCoE as a transit switch, where FC is broken out further upstream in the network.

EN2092 1 Gb Ethernet Scalable Switch

The IBM Flex System EN2092 1 Gb Ethernet Scalable switch ([Figure E.2](#)) provides outstanding flexibility, allowing you to buy one switch today and enhance its functionality in the future. The scalable architecture allows you to support 2-port or 4-port 1 Gb adapters with this switch. The EN2092 supports up to 28 server ports and up to 20 1 Gb uplinks and four 10 Gb uplinks. Designed with top performance in mind, the EN2092 provides high availability with legendary IBM quality and switch failover capability.

This switch is an exceptionally flexible integrated switch with extreme scalability and performance, while also deliver-



ing best-in-class networking innovations to help you address today's networking requirements. It also provides advanced capabilities to address future needs.

Here are some quick 1 Gb Scalable Switch facts:

- “Pay as you grow” scalability with the ability to turn on additional 1 Gb ports or 10 Gb capacity
- Simpler management with IBM’s innovative VMready virtualization-aware networking for automated Virtual Machine mobility
- Investment protection for your 1 Gb or 10 Gb network infrastructure
- Integrated network management allowing network administrators to manage servers, storage, and networks together as one logical unit.



- [1 Gb Scalable Switch details on PartnerWorld](#)
- [1 Gb Scalable Switch details on IBM.com](#)
- [1 Gb Scalable Switch competitive info on COMP](#)

Figure E.2. IBM Flex System EN2092 1 Gb Ethernet Scalable Switch (and links to more detail).



EN4091 10 Gb Ethernet Pass-Thru Module

The Flex System EN4091 10 Gb Ethernet Pass-Thru Module (Figure E.3) offers easy connectivity of the Flex System Chassis to any external network infrastructure. This unmanaged device enables direct connectivity of the compute node in the chassis to an external top-of-rack data center switch. This module can function at both 1 Gb and 10 Gb. It has 14 internal 10 Gb links, and 14 external 10 Gb SFP+ uplinks.

Here are some quick 10 Gb Ethernet Pass-Thru Module facts:

- Offers easy connectivity of the Flex System Chassis to any external network infrastructure
- Enables direct connectivity of the compute node in the chassis to an external top-of-rack data center switch
- Can function at both 1 Gb and 10 Gb



- [10 Gb Ethernet Pass-Thru Module details on PartnerWorld](#)
- [10 Gb Ethernet Pass-Thru Module details on IBM.com](#)
- [10 Gb Ethernet Pass-thru Module competitive info on COMP](#)

Figure E.3. IBM Flex System EN4091 10 Gb Ethernet Pass-Thru Module (and links to more detail).



- Provides 14 internal 10 Gb links, and 14 external 10 Gb SFP+ uplinks.

Fibre Channel

Fibre Channel is the dominant choice for storage connectivity today. The IBM Flex System portfolio offers both 8 Gb and 16 Gb SAN connectivity offerings for seamless integration with your SAN environment. Supporting a range of technologies and performance levels, these offerings are:

MORE ON THE WEB

- [Fibre channel switches and adapters](#)

- **Integrated**—Helps manage the LAN and SAN network via a single integrated tool. Advanced licensing features enable advanced SAN functions and monitoring.
- **Optimized**—High performance scalable offerings offer 8 Gb and 16 Gb Fibre Channel connectivity to support easy integration with your existing SAN and simple and cost effective scalability for future growth.
- **Automated**—Advanced virtualization features enable both physical and virtual SAN setup and management.

FC5022 8/16 Gb SAN Scalable Switch

The IBM Flex System FC5022 SAN Scalable Switch ([Figure E.4](#)) meets the demands of hyper-scale, private cloud networked storage environments by delivering market-leading 16/8 Gbps Fibre Channel technology as well as expert optimized, automated and integrated capabilities. The switch is designed



to support highly virtualized computing and Storage Area Network (SAN) environments with high performance, reliability and usability. The IBM Flex System FC5022 SAN Scalable Switch is available as a 12-port base model, 24-port model and a 24-port Enterprise model. The enterprise model includes a powerful enterprise software bundle of advanced SAN fabric services. Through Feature on Demand license keys, customers can now activate additional ports on the base switch, or enable advanced capabilities such as fabric watch and ISL trunking, by applying software license keys.

Here are some quick 1 Gb Scalable Switch facts:

- Provides exceptional value, flexibility, simplicity, and enterprise-class functionality
- Enables fast, easy, and cost-effective scaling from 12 to 48 ports
- Simplifies compute node connectivity and storage area networks (SAN) scalability



- [8/16 Gb SAN Scalable Switch details on PartnerWorld](#)
- [8/16 Gb SAN Scalable Switch details on IBM.com](#)
- [8/16 Gb SAN Scalable Switch competitive info on COMP](#)

Figure E.4. IBM Flex System FC5022 8/16 Gb SAN Scalable Switch (and links to more detail).



- Through Feature on Demand license keys, customers can now activate additional ports or enable advanced capabilities such as fabric watch and ISL trunking.

FC3171 8 Gb SAN Switch/Pass-Thru Module

The IBM Flex System FC3171 8 Gb SAN Switch ([Figure E.5](#)) and FC3171 8 Gb SAN Pass Thru provides an integrated, simple connection to existing SAN fabrics and storage. Based on QLogic's proven fibre channel expertise, these switch modules set up quickly and are easy to manage. These high performance integrated switch solutions minimize time and risk, supporting faster access to your data and quicker and better business decisions. The IBM Flex System FC3171 8 Gb SAN Switch is an ideal solution when connecting directly to fibre channel based storage. It is easy to deploy and manage using the IBM management appliance or Qlogic tools. The SAN Switch provides the full management, enhanced security, and zoning capabilities found with a SAN fabric. Full featured and cost effective, it provides high performance connectivity to your existing SAN environment.

Here are some quick 8 Gb SAN Switch facts:

- Seamless low cost connectivity to storage at 8 Gb or 4 Gb speed
- Two offerings to match client requirement—switch mode and pass thru mode.
- Enhanced N_Port ID Virtualization (NPIV) capability across 14 ITEs
- Auto-StreamGuard to guarantee streaming data operations



- [8 Gb SAN Switch/Pass-Thru Module details on PartnerWorld](#)
- [8 Gb SAN Switch/Pass-Thru Module details on IBM.com](#)
- [8 Gb SAN Switch/Pass-Thru Module competitive info on COMP](#)

Figure E.5. IBM Flex System FC3171 8 Gb SAN Switch/Pass-Thru Module (and links to more detail).

- Port aggregation—combine ports to increase bandwidth
- Automatic failover preconfigured for peace of mind.

InfiniBand

The network architecture on the IBM Flex System platform has been specifically designed to address data center challenges, giving you a very scalable way to integrate, optimize, and automate your data center. Trading volumes keep rising, bringing existing systems to their limits. IBM Flex System enables next generation InfiniBand offerings for the high performance and low latency required for HPC and financial services applications.

MORE ON THE WEB

- [InfiniBand switches and adapters](#)



IB6131 InfiniBand Switch

The IBM Flex System IB6131 InfiniBand Switch ([Figure E.6](#)) is designed to offer the performance you need to support clustered databases, parallel processing, transactional services, and high-performance embedded I/O applications, reducing task completion time and lowering cost per operation. Virtual Protocol Interconnect also simplifies system development by serving multiple fabrics with one hardware design. This switch is designed for low latency, high bandwidth, and computing efficiency for performance-driven server and storage clustering applications. Combined with the InfiniBand FDR adapter, your organization can achieve efficient computing by offloading from the CPU protocol processing and data movement overhead such as RDMA and Send/Receive semantics, allowing more processor power for the application. CORE-Direct brings the next level of performance improvement by offloading application overhead, such as data broadcasting and gathering, as well as global synchronization communication routines.



- [IB6131 Switch details on PartnerWorld](#)
- [IB6131 Switch details on IBM.com](#)
- [IB6131 Switch competitive info on COMP](#)

Figure E.6. IBM Flex System IB6131 InfiniBand Switch (and links to more detail).



Here are some quick InfiniBand Switch facts:

- High performance FDR (fourteen data rate) speed that can auto negotiate to QDR (quad data rate) speed also
- Offers up to 18 uplinks ports for 14 servers, allowing high speed throughput with zero oversubscription
- Suited for clients running InfiniBand infrastructure in high performance computing and financial services
- Less than 0.7 usec latency node to node—nearly half of QDR InfiniBand latency.

IB6132 2-port FDR InfiniBand Switch

The IBM Flex System IB6132 2-port FDR InfiniBand Switch is a high-speed InfiniBand device designed to meet your critical performance needs.

The adapter is based on Mellanox technology and supports switch-embedded subnet managers and host-based subnet managers.

MORE ON THE WEB

- [IB6132 Switch details on PartnerWorld](#)
- [IB6132 Switch details on IBM.com](#)
- [IB6132 Switch competitive info on COMP](#)

Here are some quick IB6132 facts:

- A 4-port 10 Gb Ethernet adapter based on Mellanox Connect X3 ASIC
- Enables high speed InfiniBand connectivity for x86 compute nodes
- Supports RDMA and RoCE technologies



- Helps provide application acceleration
- Helps provide low latency for specialized applications.

Flex System Manager

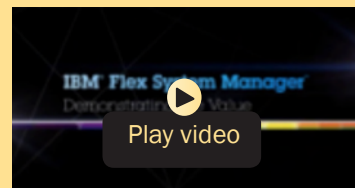
IBM Flex System Manager is designed to help you get the most out of your IBM PureFlex System and your IBM Flex System by automating repetitive tasks. Flex System Manager can significantly reduce the number of manual navigational steps for typical management tasks.

From simplified system set-up procedures with wizards and built-in expertise, to consolidated monitoring for all of your physical and virtual resources—compute, storage, and networking—Flex System Manager provides core management functionality along with automation so you can focus your efforts on business innovation.

Flex System Manager helps you gain more from your infrastructure-wide virtualization by allowing you to reduce the total cost of ownership of your virtualized environment—compute, storage, and networks—by decreasing management costs, increasing asset utilization, and linking infrastructure

MORE ON THE WEB

- [Flex System Manager details on PartnerWorld](#)
- [Flex System Manager details on IBM.com](#)
- [Flex System Manager competitive info on COMP](#)



Flex System Manager demo (3:55)



performance to goals. Flex System Manager simplifies the management of virtual environments across multiple virtualization technologies and hardware platforms, freeing you from “silos of virtualization” and delivering visibility and control.

With a workload-optimized approach you can decrease infrastructure costs and improve service levels. A system pool is a group of virtualized system components that are managed as a single entity, allowing you to manage the pools with the simplicity of managing a single system—an essential capability for moving to cloud computing and a dynamic infrastructure.

Here are some quick Flex System Manager facts:

- Integrated control: management integration of physical and virtual compute, storage, and networking resources from a single vantage point
- Smart provisioning: automation and optimization expertise for dynamic allocation of resources through policy-driven virtualized system pools
- Simplified processes: automation of repetitive management tasks to allow IT experts time.

Fabric Manager

IBM Fabric Manager is an easy-to-use server provisioning I/O management tool. Unlike performing deployment steps manually, the parameters are configured automatically. Fabric Manager offers automatic provisioning of I/O addresses, pre-defined configurations of I/O parameters, I/O parameter and



VLAN migration to standby compute nodes, and other features.

Here are some quick Fabric Manager facts:

- Automates deployment steps by loading parameters
- Monitors data center operations with event notifications and automatic server failover
- Manages risk to keep your business running with automated I/O failover to standby compute nodes.

MORE ON THE WEB

- [Fabric Manager info on PartnerWorld](#)
- [Fabric Manager info on IBM.com](#)

4

IBM Systems Lab Services and STG Technical Training

In this chapter we take a look at the Systems Lab Services and STG Technical Training for IBM PureSystems.

Lab Services

IBM Systems Lab Services offers deployment services, which ensure the end client is able to take advantage of all the robust capabilities and provide some skills transfer on configuration and key tools such as the FSM and other vital systems. The goal is to help the client

MORE ON THE WEB

- [IBM Systems Lab Services info on PartnerWorld](#)
- [IBM Systems Lab Services info on IBM.com](#)

maximize the use of the PureFlex technology quickly within their IT departments and start seeing a return on their investment as quickly as possible.

Effective November 30, 2012, removing configuration and deployment services performed by IBM Lab Services no longer requires a special bid. PureFlex configuration & deployment services can be performed by qualified business partners or IBM Services for the Express, Standard, and En-





terprise offerings. This allows partners to build out high value services around PureFlex and Flex systems and to grow margin while providing flexibility to meet clients' needs.

STG Technical Training

Here are some examples of the technical training available:

PureFlex Systems Introduction

- NGT10 3 days Classroom Offering
- NGV10 3 days Live Virtual Class
- NGP10 Self Paced Virtual Class

IBM PureFlex System Fundamentals

- NGT11 3 days Classroom Offering
- NGV11 3 days Live Virtual Class

Flex System x240 Compute Node

- NGT20 3 days Classroom Offering
- NGV20 3 days Live Virtual Class

Flex System p260 & p460 Compute Node

- NGT30 3 days Classroom Offering
- NGV30 3 days Live Virtual Class

Flex System Overview with System Management Focus

- NGT40 3 days Classroom Offering
- NGV40 3 days Live Virtual Offering

MORE ON THE WEB

- [PureFlex course descriptions, schedules, and pricing](#)



Flex System Scalable Networks

NGT50 3 days Classroom Offering

NGV50 3 days Live Virtual Offering

About the Editor

Jim Hoskins is the founder of Maximum Press, a premier publisher of books, ebooks, and rich media that help businesses apply technology profitably. Jim has been involved with computer technology design, implementation, and education for over 25 years. He is the author of many articles and books covering a wide range of technology and Internet business topics. Jim spent a decade with IBM designing computer systems and directly helping businesses of all sizes design and implement real-world solutions. He is the author/editor of the popular *Exploring IBM* series, which has sold over 350,000 copies in 12 languages. Jim has a degree in electrical engineering from the University of Florida and resides in Gulf Breeze, Florida, with his wife and five children. You can reach Jim via email at jimh@maxpress.com.