# EMC SYMMETRIX VMAX 20K

The EMC® Virtual Matrix Architecture™ is a new way to build storage systems that transcends the physical constraints of all existing architectures by scaling system resources through common building blocks called EMC® Symmetrix® VMAX® 20K engines.

A single VMAX 20K engine provides the complete foundation for a high-availability Symmetrix VMAX 20K system. Each VMAX 20K engine contains two Symmetrix VMAX 20K directors and redundant interfaces to the EMC Virtual Matrix™ interconnect. Each Symmetrix VMAX 20K director consolidates front-end, global memory, and back-end functions, enabling direct memory access to data for optimized I/O operations.

VMAX 20K engines are interconnected via a set of multiple active fabrics that provides scalable performance and high availability. VMAX 20K engines can be added non-disruptively to provide linear scale-out of Symmetrix system resources. The Virtual Matrix is architected to scale to dozens of engines, geographically dispersed throughout a data center, delivering unprecedented scale of infrastructure services under a single point of management.

## VMAX 20K ENGINE MAXIMUM SPECIFICATIONS

- Four Quad-core 2.33 GHz Intel® Xeon® processors
- Up to 128 GB of memory
- Virtual Matrix bandwidth: 24 GB/s

## VMAX 20K MAXIMUM SYSTEM SPECIFICATIONS

- Eight VMAX 20K engines
- 1 TB of memory
- Virtual Matrix bandwidth: 192 GB/s

## VMAX 20K INTERCONNECT

Industry-standard RapidIO® fabric (Virtual Matrix Architecture is extensible to other standard interconnects.)

## CONNECTIVITY

Symmetrix VMAX 20K systems are available in configurations supporting up to eight VMAX 20K engines with a maximum of 128 front-end ports. Optimized hardware logic and data protection encoding ensures end-to-end data integrity with automated channel failover for a maximum availability and load balancing. Symmetrix VMAX 20K systems support all popular hardware and operating system platforms, storage area networks (SANs), and high availability cluster environments. IPv4, IPsec, and compression support are available with 1 GB/s Ethernet ports. IPv6 support is available with 10 GB/s Ethernet.
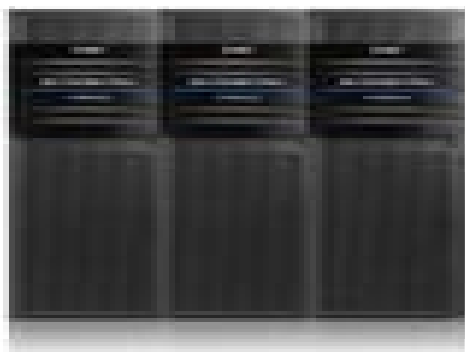
VMAX 20K high-density configurations support up to 2,400 drives, consuming 33 percent less space, 25 percent less weight, and 27 percent less power compared with 3.5-inch drives.

EMC²

# Configuration And Resource Guide For Symmetrix Vmax

Carsten Larsen,Corne Lottering,Douwe van Terwisga,Hartmut Lonzer,Jon Herd,Kendall Williams,Konrad Trojok,Shu Mookerjee,Vasfi Gucer,IBM Redbooks

**Configuration And Resource Guide For Symmetrix Vmax:**

**IBM FlashSystem Best Practices and Performance Guidelines** Anil K Nayak,Antonio Rainero,Barry Whyte,Chris Hoffmann,Danilo Morelli Miyasiro,David Green,Duane Bolland,Jackson Shea,Jon Herd,Jordan Fincher,Marcelo Avalos,Sergey Kubin,Sidney Varoni Junior,Thales Noivo Ferreira,Vasfi Gucer,IBM Redbooks,2021-10-13 This IBM Redbooks publication captures several of the preferred practices and describes the performance gains that can be achieved by implementing the IBM FlashSystem products These practices are based on field experience This book highlights configuration guidelines and preferred practices for the storage area network SAN topology clustered system back end storage storage pools and managed disks volumes Remote Copy services and hosts It explains how you can optimize disk performance with the IBM System Storage Easy Tier function It also provides preferred practices for monitoring maintaining and troubleshooting This book is intended for experienced storage SAN IBM FlashSystem SAN Volume Controller and IBM Storwize administrators and technicians Understanding this book requires advanced knowledge of these environments IBM SAN Volume Controller Best Practices and Performance Guidelines Anil K Nayak,Antonio Rainero,Barry Whyte,Chris Hoffmann,Danilo Morelli Miyasiro,David Green,Duane Bolland,Jackson Shea,Jon Herd,Jordan Fincher,Marcelo Avalos,Sergey Kubin,Sidney Varoni Junior,Thales Noivo Ferreira,Vasfi Gucer,IBM Redbooks,2021-10-13 This IBM Redbooks publication describes several of the preferred practices and describes the performance gains that can be achieved by implementing the IBM SAN Volume Controller powered by IBM Spectrum Virtualize V8 4 These practices are based on field experience This book highlights configuration guidelines and preferred practices for the storage area network SAN topology clustered system back end storage storage pools and managed disks volumes Remote Copy services and hosts Then it provides performance guidelines for IBM SAN Volume Controller back end storage and applications It explains how you can optimize disk performance with the IBM System Storage Easy Tier function It also provides preferred practices for monitoring maintaining and troubleshooting IBM SAN Volume Controller This book is intended for experienced storage SAN and IBM SAN Volume Controller administrators and technicians Understanding this book requires advanced knowledge of the IBM SAN Volume Controller IBM FlashSystem and SAN environments IBM FlashSystem Best Practices and Performance Guidelines for IBM Spectrum Virtualize Version 8.4.2 Antonio Rainero,Carlton Beatty,David Green,Hartmut Lonzer,Jonathan Wilkie,Kendall Williams,Konrad Trojok,Mandy Stevens,Nezih Boyacıoglu,Nils Olsson,Renato Santos,Rene Oehme,Sergey Kubin,Thales Noivo Ferreira,Uwe Schreiber,Vasfi Gucer,IBM Redbooks,2022-02-02 This IBM Redbooks publication captures several of the preferred practices and describes the performance gains that can be achieved by implementing the IBM FlashSystem products that are powered by IBM Spectrum Virtualize Version 8 4 2 These practices are based on field experience This book highlights configuration guidelines and preferred practices for the storage area network SAN topology clustered system back end storage storage pools and managed disks volumes Remote Copy services and hosts It explains how you can optimize disk

performance with the IBM System Storage Easy Tier function It also provides preferred practices for monitoring maintaining and troubleshooting This book is intended for experienced storage SAN IBM FlashSystem SAN Volume Controller and IBM Storwize administrators and technicians Understanding this book requires advanced knowledge of these environments

   **IBM PowerVC Version 1.3.2 Introduction and Configuration** Scott Vetter,Javier Bazan Lazcano,Martin Parrella,IBM Redbooks,2017-06-12 IBM Power Virtualization Center IBM PowerVCTM is an advanced enterprise virtualization management offering for IBM Power SystemsTM This IBM Redbooks publication introduces IBM PowerVC and helps you understand its functions planning installation and setup IBM PowerVC Version 1 3 2 supports both large and small deployments either by managing IBM PowerVM that is controlled by the Hardware Management Console HMC by IBM PowerVM NovaLink or by managing PowerKVM directly With this capability IBM PowerVC can manage IBM AIX IBM i and Linux workloads that run on IBM POWER hardware IBM PowerVC is available as a Standard Edition or as a Cloud PowerVC Manager edition IBM PowerVC includes the following features and benefits Virtual image capture deployment and management Policy based virtual machine VM placement to improve use Management of real time optimization and VM resilience to increase productivity VM Mobility with placement policies to reduce the burden on IT staff in a simple to install and easy to use graphical user interface GUI Role based security policies to ensure a secure environment for common tasks The ability to enable an administrator to enable Dynamic Resource Optimization on a schedule IBM Cloud PowerVC Manager includes all of the IBM PowerVC Standard Edition features and adds A Self service portal that allows the provisioning of new VMs without direct system administrator intervention There is an option for policy approvals for the requests that are received from the self service portal Pre built deploy templates that are set up by the cloud administrator that simplify the deployment of VMs by the cloud user Cloud management policies that simplify management of cloud deployments Metering data that can be used for chargeback This publication is for experienced users of IBM PowerVM and other virtualization solutions who want to understand and implement the next generation of enterprise virtualization management for Power Systems Unless stated otherwise the content of this publication refers to IBM PowerVC Version 1 3 2    **Compliance Engineering ... Reference Guide** ,2000    **IBM FlashSystem 7200 Product Guide** Jon Herd,IBM Redbooks,2021-04-14 This IBM Redbooks Product Guide publication describes the IBM FlashSystem 7200 solution which is a comprehensive all flash and NVMe enabled enterprise storage solution that delivers the full capabilities of IBM FlashCore technology In addition it provides a rich set of software defined storage SDS features including data reduction and de duplication dynamic tiering thin provisioning snapshots cloning replication data copy services and IBM HyperSwap for high availability HA Scale out and scale up configurations further enhance capacity and throughput for better availability    *VMware Software-Defined Storage* Martin Hosken,2016-08-11 The inside guide to the next generation of data storage technology VMware Software Defined Storage A Guide to the Policy Driven Software Defined Storage Era presents the most in depth

look at VMware s next generation storage technology to help solutions architects and operational teams maximize quality storage design Written by a double VMware Certified Design Expert this book delves into the design factors and capabilities of Virtual SAN and Virtual Volumes to provide a uniquely detailed examination of the software defined storage model Storage as a Service STaaS is discussed in terms of deployment through VMware technology with insight into the provisioning of storage resources and operational management while legacy storage and storage protocol concepts provide context and demonstrate how Virtual SAN and Virtual Volumes are meeting traditional challenges The discussion on architecture emphasizes the economies of storage alongside specific design factors for next generation VMware based storage solutions and is followed by an example in which a solution is created based on the preferred option identified from a selection of cross site design options Storage hardware lifecycle management is an ongoing challenge for IT organizations and service providers VMware is addressing these challenges through the software defined storage model and Virtual SAN and Virtual Volumes technologies this book provides unprecedented detail and expert guidance on the future of storage Understand the architectural design factors of VMware based storage Learn best practices for Virtual SAN stretched architecture implementation Deploy STaaS through vRealize Automation and vRealize Orchestrator Meet traditional storage challenges with next generation storage technology Virtual SAN and Virtual Volumes are leading the way in efficiency automation and simplification while maintaining enterprise class features and performance As organizations around the world are looking to cut costs without sacrificing performance availability or scalability VMware based next generation storage solutions are the ideal platform for tomorrow s virtual infrastructure VMware Software Defined Storage provides detailed practical guidance on the model that is set to transform all aspects of vSphere data center storage *IBM SAN Volume Controller Best Practices and Performance Guidelines for IBM Spectrum Virtualize Version 8.4.2* Antonio Rainero,Carlton Beatty,David Green,Hartmut Lonzer,Jonathan Wilkie,Kendall Williams,Konrad Trojok,Mandy Stevens,Nezih Boyacioglu,Nils Olsson,Renato Santos,Rene Oehme,Sergey Kubin,Thales Noivo Ferreira,Uwe Schreiber,Vasfi Gucer,IBM Redbooks,2022-01-17 This IBM Redbooks publication captures several of the preferred practices and describes the performance gains that can be achieved by implementing the IBM SAN Volume Controller powered by IBM Spectrum Virtualize Version 8 4 2 These practices are based on field experience This book highlights configuration guidelines and preferred practices for the storage area network SAN topology clustered system back end storage storage pools and managed disks volumes Remote Copy services and hosts It explains how you can optimize disk performance with the IBM System Storage Easy Tier function It also provides preferred practices for monitoring maintaining and troubleshooting This book is intended for experienced storage SAN IBM FlashSystem IBM SAN Volume Controller and IBM Storwize administrators and technicians Understanding this book requires advanced knowledge of these environments **IBM FlashSystem 9200 Product Guide** Jon Herd,IBM Redbooks,2021-04-14 This IBM Redbooks Product Guide publication describes the IBM FlashSystem 9200 solution which is a

comprehensive all flash and NVMe enabled enterprise storage solution that delivers the full capabilities of IBM FlashCore technology In addition it provides a rich set of software defined storage SDS features including data reduction and de duplication dynamic tiering thin provisioning snapshots cloning replication data copy services and IBM HyperSwap for high availability HA Scale out and scale up configurations further enhance capacity and throughput for better availability **IBM FlashSystem 9100 Product Guide** Jon Herd,Tony Pacheco,IBM Redbooks,2020-05-20 This IBM Redbooks Product Guide publication describes IBM FlashSystem 9100 solution which is a comprehensive all flash and NVMe enabled enterprise storage solution that delivers the full capabilities of IBM FlashCore technology In addition it provides a rich set of software defined storage SDS features including data reduction and de duplication dynamic tiering thin provisioning snapshots cloning replication data copy services and IBM HyperSwap for high availability HA Scale out and scale up configurations further enhance capacity and throughput for better availability *IBM FlashSystem 7300 Product Guide* Carsten Larsen,Corne Lottering,Douwe van Terwisga,Hartmut Lonzer,Jon Herd,Kendall Williams,Konrad Trojok,Shu Mookerjee,Vasfi Gucer,IBM Redbooks,2023-04-24 This IBM Redpaper Product Guide describes the IBM FlashSystem 7300 solution which is a next generation IBM FlashSystem control enclosure It combines the performance of flash and a Non Volatile Memory Express NVMe optimized architecture with the reliability and innovation of IBM FlashCore technology and the rich feature set and high availability HA of IBM Spectrum Virtualize To take advantage of artificial intelligence AI enhanced applications real time big data analytics and cloud architectures that require higher levels of system performance and storage capacity enterprises around the globe are rapidly moving to modernize established IT infrastructures However for many organizations staff resources and expertise are limited and cost efficiency is a top priority These organizations have important investments in existing infrastructure that they want to maximize They need enterprise grade solutions that optimize cost efficiency while simplifying the pathway to modernization IBM FlashSystem 7300 is designed specifically for these requirements and use cases It also delivers a cyber resilience without compromising application performance IBM FlashSystem 7300 provides a rich set of software defined storage SDS features that are delivered by IBM Spectrum Virtualize including the following examples Data reduction and deduplication Dynamic tiering Thin provisioning Snapshots Cloning Replication and data copy services Cyber resilience Transparent Cloud Tiering TCT IBM HyperSwap including 3 site replication for high availability Scale out and scale up configurations further enhance capacity and throughput for better availability With the release of IBM Spectrum Virtualize V8 5 extra functions and features are available including support for new third generation IBM FlashCore Modules Non Volatile Memory Express NVMe type drives within the control enclosure and 100 Gbps Ethernet adapters that provide NVMe Remote Direct Memory Access RDMA options New software features include GUI enhancements security enhancements including multifactor authentication and single sign on and Fibre Channel FC portsets *Cloud Computing and Services Science* Markus Helfert,Donald Ferguson,Victor Méndez Muñoz,Jorge Cardoso,2017-07-18 This

book constitutes extended revised and selected papers from the 6th International Conference on Cloud Computing and Services Science CLOSER 2016 held in Rome Italy in April 2016 The 16 papers presented in this volume were carefully reviewed and selected from a total of 123 submissions The volume also contains two invited papers CLOSER 2016 focused on the emerging area of cloud computing inspired by recent advances related to infrastructures operations and service availability through global networks It also studied the influence of service science in this area **IBM System Storage SAN Volume Controller, IBM Storwize V7000, and IBM FlashSystem 7200 Best Practices and Performance Guidelines** Jon Tate,Tiago Moreira Candelaria Bastos,Jon Herd,Sang-hyun Kim,Sergey Kubin,Dirk Peitzmann,Antonio Rainero,IBM Redbooks,2020-12-07 This IBM Redbooks publication captures several of the preferred practices and describes the performance gains that can be achieved by implementing the IBM System Storage SAN Volume Controller and IBM Storwize V7000 powered by IBM Spectrum VirtualizeTM V8 2 1 These practices are based on field experience This book highlights configuration guidelines and preferred practices for the storage area network SAN topology clustered system back end storage storage pools and managed disks volumes remote copy services and hosts Then it provides performance guidelines for SAN Volume Controller back end storage and applications It explains how you can optimize disk performance with the IBM System Storage Easy Tier function It also provides preferred practices for monitoring maintaining and troubleshooting SAN Volume Controller and Storwize V7000 This book is intended for experienced storage SAN and SAN Volume Controller administrators and technicians Understanding his book requires advanced knowledge of the SAN Volume Controller and Storwize V7000 and SAN environments Important On 11th February 2020 IBM announced the arrival of SAN Volume Controller SA2 and SV2 and IBM FlashSystem 7200 to the family This book was written specifically for prior versions of SVC and Storwize V7000 however most of the general principles will apply If you are in any doubt as to their applicability then you should work with your local IBM representative This book will be updated to comprehensively include SAN Volume Controller SA2 and SV2 and FlashSystem 7200 in due course **IBM FlashSystem 5200 Product Guide** Aldo Araujo Fonseca,Corne Lottering,Jon Herd,Leandro Torolho,Sandro De Santis,Vasfi Gucer,IBM Redbooks,2022-07-22 This IBM Redbooks Product Guide publication describes the IBM FlashSystem 5200 solution which is a next generation IBM FlashSystem control enclosure It is an NVMe end to end platform that is targeted at the entry and midrange market and delivers the full capabilities of IBM FlashCore technology It also provides a rich set of software defined storage SDS features that are delivered by IBM Spectrum Virtualize including the following features Data reduction and deduplication Dynamic tiering Thin provisioning Snapshots Cloning Replication Data copy services Transparent Cloud Tiering IBM HyperSwap including 3 site replication for high availability HA Scale out and scale up configurations further enhance capacity and throughput for better availability The IBM FlashSystem 5200 is a high performance storage solution that is based on a revolutionary 1U form factor It consists of 12 NVMe Flash Devices in a 1U storage enclosure drawer with full redundant

canister components and no single point of failure It is designed for businesses of all sizes including small remote branch offices and regional clients It is a smarter self optimizing solution that requires less management which enables organizations to overcome their storage challenges Flash has come of age and price point reductions mean that lower parts of the storage market are seeing the value of moving over to flash and NVMe based solutions The IBM FlashSystem 5200 advances this transition by providing incredibly dense tiers of flash in a more affordable package With the benefit of IBM FlashCore Module compression and new QLC flash based technology becoming available a compelling argument exists to move away from Nearline SAS storage and on to NVMe With the release of IBM FlashSystem 5200 Software V8 4 extra functions and features are available including support for new Distributed RAID1 DRAID1 features GUI enhancements Redirect on write for Data Reduction Pool DRP snapshots and 3 site replication capabilities This book is aimed at pre sales and post sales technical support and marketing and storage administrators **Mastering VMware vSphere 5** Scott Lowe,2011-09-29 A new and updated edition of bestselling Mastering VMware vSphere 4 Written by leading VMware expert this book covers all the features and capabilities of VMware vSphere You ll learn how to install configure operate manage and secure the latest release Covers all the new features and capabilities of the much anticipated new release of VMware vSphere Discusses the planning installation operation and management for the latest release Reviews migration to the latest vSphere software Offers hands on instruction and clear explanations with real world examples Mastering VMware vSphere is the strategic guide you need to maximize the opportunities of virtualization **Symmetrix 26 Success Secrets - 26 Most Asked Questions on Symmetrix - What You Need to Know** Justin Sawyer,2014-10-30 Best book on Symmetrix Bar None There has never been a Symmetrix Guide like this It contains 26 answers much more than you can imagine comprehensive answers and extensive details and references with insights that have never before been offered in print Get the information you need fast This all embracing guide offers a thorough view of key knowledge and detailed insight This Guide introduces what you want to know about Symmetrix A quick look inside of some of the subjects covered Computer data storage Volatility SRDF EMC NetWorker VCE company Original systems EMC Celerra HighRoad RecoverPoint Integration with other products FICON Devices EMC VPLEX History Symmetrix VMAX EMC VPLEX Architecture EMC Symmetrix EMC Corporation History Multi Path File System Description 3PAR Products Symmetrix Features Moshe Yanai VCE company Products and services Moshe Yanai Biography Data General CLARiiON Physical memory Volatility Silver Peak Systems EMC Symmetrix History Computer storage Volatility Symmetrix Remote Data Facility Clariion CX4 UltraFlex series and much more **PVCS Configuration Builder Reference Guide** INTERSOLV, Inc,1993 **MVS/extended Architecture MVS Configuration Program Guide and Reference** International Business Machines Corporation,1987 This book explains how to use the MVS configuration program

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## Configuration And Resource Guide For Symmetrix Vmax Introduction

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