

IBM System Storage DS8870 Architecture and Implementation

Dual IBM POWER7 based controllers
with up to 1 TB of cache

SCSI reserve
detection and removal

Additional Easy Tier features



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Redbooks

Ibm System Storage Ds8870 Architecture And Implementation

**Bertrand Dufrasne, Werner Bauer, Artur
Borowicz, Adrian Orben, Robert
Tondini, Bob Xiao, IBM Redbooks**

Ibm System Storage Ds8870 Architecture And Implementation:

IBM System Storage DS8870 Architecture and Implementation Bertrand Dufrasne, Bruno Barbosa, Peter Cronauer, Delmar Demarchi, Hans-Paul Drumm, Ronny Eliahu, Karl Hohenauer, Xin Liu, Michael Stenson, Bjoern Wesselbaum, 2013 This IBM Redbooks publication describes the concepts architecture and implementation of the IBM System Storage DS8870 storage system The book provides reference information to assist readers who need to plan for install and configure the DS8870 The IBM System Storage DS8870 is the most advanced model in the IBM DS8000 series and is equipped with IBM POWER7 based controllers Various configuration options are available that scale from dual 2 core systems up to dual 16 core systems with up to 1 TB of cache The DS8870 also features enhanced 8 Gbps device adapters and host adapters Connectivity options with up to 128 Fibre Channel IBM FICON ports for host connections make the DS8870 suitable for multiple server environments in open systems and IBM System z environments The DS8870 supports advanced disaster recovery solutions business continuity solutions and thin provisioning All disk drives in the DS8870 storage system have the Full Disk Encryption FDE feature The DS8870 also can be integrated in a Lightweight Directory Access Protocol LDAP infrastructure The DS8870 is equipped with high density storage enclosures and can be equipped with solid state drives SSDs The DS8870 can automatically optimize the use of each storage tier particularly SSDs through the IBM Easy Tier feature which is available at no extra charge With Licensed Machine Code 7 7 10 xx xx Easy Tier offers new features still at no charge

IBM DS8870 Architecture and Implementation (Release 7.5) Bertrand Dufrasne, Werner Bauer, Artur Borowicz, Adrian Orben, Robert Tondini, Bob Xiao, IBM Redbooks, 2017-09-19 This IBM Redbooks publication describes the concepts architecture and implementation of the IBM DS8870 The WhitepaperRedpaperbook provides reference information to assist readers who need to plan for install and configure the DS8870 The IBM DS8870 is the most advanced model in the IBM DS8000 series and is equipped with IBM POWER7 TM based controllers Various configuration options are available that scale from dual 2 core systems up to dual 16 core systems with up to 1 TB of cache The DS8870 features an integrated High Performance Flash Enclosure HPFE with flash cards that can deliver up to 250 000 IOPS and up to 3 4 Gbps bandwidth A High Performance All Flash configuration is also available The DS8870 now features 16 Gbps host adapters Connectivity options with up to 128 Fibre Channel IBM FICON ports for host connections make the DS8870 suitable for multiple server environments in open systems and IBM zTM Systems environments DS8870 Release 7 5 brings new and enhanced IBM z SystemsTM synergy features These features are covered in detail in IBM DS8870 and IBM z Systems Synergy REDP 5186 The DS8870 supports advanced disaster recovery solutions business continuity solutions and thin provisioning All disk drives in the DS8870 storage system have the Full Disk Encryption FDE feature The DS8870 also can be integrated in a Lightweight Directory Access Protocol LDAP infrastructure The DS8870 can automatically optimize the use of each storage tier particularly flash drives and flash cards through the IBM Easy Tier feature which is available at no extra charge This edition

applies the IBM DS8870 Release 7.5 **IBM DS8870 Architecture and Implementation** Bertrand Dufrasne, Warren Stanley, Don Skilton, Stephen Manthorpe, Sherri Brunson, Artur Borowicz, Bertrand Dufrasne, 2015 This IBM Redbooks publication describes the concepts architecture and implementation of the IBM DS8870 The book provides reference information to assist readers who need to plan for install and configure the DS8870 The IBM DS8870 is the most advanced model in the IBM DS8000 series and is equipped with IBM POWER7 based controllers Various configuration options are available that scale from dual 2 core systems up to dual 16 core systems with up to 1 TB of cache The DS8870 features an integrated high performance flash enclosure with flash cards that can deliver up to 250 000 IOPS and up to 3.4 GBps bandwidth A High Performance All Flash configuration is also available The DS8870 also features enhanced 8 Gbps device adapters and host adapters Connectivity options with up to 128 Fibre Channel IBM FICON ports for host connections make the DS8870 suitable for multiple server environments in open systems and IBM System z environments The DS8870 supports advanced disaster recovery solutions business continuity solutions and thin provisioning All disk drives in the DS8870 storage system have the Full Disk Encryption FDE feature The DS8870 also can be integrated in a Lightweight Directory Access Protocol LDAP infrastructure The DS8870 can automatically optimize the use of each storage tier particularly flash drives and flash cards through the IBM Easy Tier feature which is available at no extra charge This edition applies to Version 7 release 4 of IBM DS8870 **IBM System Storage TS7600 with ProtecTIER Version 3.3** Karen Orlando, Eva Balogh, Randi Galron, Jose Roberto Mosqueda Mejia, Rob Wilson, IBM Redbooks, 2014-02-07 This IBM Redbooks publication describes the IBM solution for data deduplication the IBM System Storage TS7650G IBM ProtecTIER Deduplication Gateway and the IBM TS7620 ProtecTIER Deduplication Appliance Express This solution consists of the IBM System Storage ProtecTIER Enterprise Edition V3.3 software and the IBM System Storage TS7600 family of products They are designed to address the disk based data protection needs of enterprise data centers We describe the components that make up IBM System Storage TS7600 with ProtecTIER and provide extensive planning and sizing guidance that enables you to determine your requirements and the correct configuration for your environment We then guide you through the basic setup steps on the system and on the host We also describe all operational tasks that are required during normal day to day operation or when upgrading your TS7600 products All available models of the ProtecTIER deduplication system can now be ordered in a configuration to operate in one of the following modes for which we provide setup configuration and usage guidelines for your business needs The Virtual Tape Library VTL interface is the foundation of ProtecTIER and emulates traditional automated tape libraries The Symantec NetBackup OpenStorage OST API can be integrated with Symantec NetBackup to provide backup to disk without having to emulate traditional tape libraries The newly available File System Interface FSI supports Common Internet File System CIFS and Network File System NFS as a backup target This publication is intended for system programmers storage administrators hardware and software planners and other IT personnel that are involved in

planning implementing and the use of the IBM deduplication solution It also is intended for anyone seeking detailed technical information about the IBM System Storage TS7600 with ProtecTIER *IBM DS8870 and VMware Synergy* Karl Hohenauer,Bert Dufrasne,Peter Cronauer,Bruno Anderson Barbosa,Xin Liu,IBM Redbooks,2013-08-20 This IBM Redpaper™ publication describes the support of the IBM System Storage DS8870 for VMware vSphere in general terms It also describes in greater detail the VMware vSphere Storage APIs Array Integration VAAI primitives the IBM Storage Management Console for VMware plug in and the IBM Site Replication Adapter SRA for VMWare Site Recovery Manager SRM In addition to a high level overview of the VMWare vSphere suite this paper emphasizes the interaction of the software components with the IBM System Storage DS8870 It is intended for IT professionals who want an understanding of advantages such as off loading specific tasks to storage arrays centralized service management and simplified implementation of disaster recovery processes in virtualized environments **IBM DS8870 Easy Tier Heat Map Transfer** Bert Dufrasne,Artur Borowicz,IBM Redbooks,2015-06-23 This IBM Redpaper™ publication describes the concepts functions and practical usage of IBM Easy Tier Heat Map Transfer HMT IBM System Storage DS8000 Easy Tier is designed to automate data placement throughout the storage system disks pool Easy Tier generates a heat map It is a workload activity metric for each extent in a logical volume With Easy Tier HMT it is possible to transfer the heat map from a mirrored primary site and reapply it periodically at secondary and tertiary sites by using the Easy Tier Heat Map Transfer Utility HMTU This capability helps maintain storage performance after a failover to a remote site With DS8870 Release 7 5 the heat map transfer supports Metro Global Mirror MGM replication topology in addition to Metro Mirror Global Copy Global Mirror MM GC GM functions This paper is for those professionals who want to understand the Easy Tier HMT concept and its underlying design It also provides guidance and practical illustrations about the operation of the HMTU For more information about the general concept of Easy Tier see IBM DS8000 Easy Tier REDP 4667 For more information about Easy Tier Server and Easy Tier Application see the following publications IBM System Storage DS8000 Easy Tier Server REDP 5013 DS8870 Easy Tier Application REDP 5014 **IBM DS8880 Architecture and Implementation (Release 8.51)** Bert Dufrasne,Sherry Brunson,Peter Kimmel,Stephen Manthorpe,Andreas Reinhardt,Connie Riggins,Tamás Tóser,Axel Westphal,IBM Redbooks,2019-02-26 Updated for R8 51 This IBM Redbooks publication describes the concepts architecture and implementation of the IBM DS8880 family The book provides reference information to assist readers who need to plan for install and configure the DS8880 systems The IBM DS8000 family is a high performance high capacity highly secure and resilient series of disk storage systems The DS8880 family is the latest and most advanced of the DS8000 offerings to date The high availability multiplatform support including IBM Z and simplified management tools help provide a cost effective path to an on demand and cloud based infrastructures The IBM DS8880 family now offers business critical all flash and hybrid data systems that span a wide range of price points DS8882F Rack Mounted storage system DS8884 Business Class DS8886 Enterprise Class DS8888 Analytics Class The

DS8884 and DS8886 are available as either hybrid models or can be configured as all flash. Each model represents the most recent in this series of high performance, high capacity, flexible and resilient storage systems. These systems are intended to address the needs of the most demanding clients. Two powerful IBM POWER8 processor based servers manage the cache to streamline disk I/O, maximizing performance and throughput. These capabilities are further enhanced with the availability of the second generation of high performance flash enclosures, HPFEs Gen 2, and newer flash drives. Like its predecessors, the DS8880 supports advanced disaster recovery, DR solutions, business continuity solutions, and thin provisioning. All disk drives in the DS8880 storage system include the Full Disk Encryption (FDE) feature. The DS8880 can automatically optimize the use of each storage tier, particularly flash drives, by using the IBM Easy Tier feature. Release 8.5 introduces the Safeguarded Copy feature. The DS8882F Rack Mounted is described in a separate publication. Introducing the IBM DS8882F Rack Mounted Storage System REDP 5505

IBM Storage DS8900F Architecture and Implementation: Updated for Release 9.3.2

Peter Kimmel, Daniel Beukers, Jeff Cook, Bozhidar Feraliev, Jörg Klemm, Connie Riggins, Gauurav Sabharwal, IBM Redbooks, 2023-03-29. This IBM Redbooks publication describes the concepts, architecture, and implementation of the IBM Storage DS8900F family. The book provides reference information to assist readers who need to plan for install and configure the DS8900F systems. This edition applies to DS8900F systems with IBM Storage DS8000 Licensed Machine Code LMC 7.9.30 bundle version 89.30.xx.x, referred to as Release 9.3. The DS8900F systems are all flash exclusively and they are offered as three classes: DS8980F Analytic Class, The DS8980F Analytic Class offers best performance for organizations that want to expand their workload possibilities to artificial intelligence (AI), Business Intelligence (BI), and machine learning (ML). IBM DS8950F Agility Class, The Agility Class consolidates all your mission-critical workloads for IBM Z, IBM LinuxONE, IBM Power, and distributed environments under a single all-flash storage solution. IBM DS8910F Flexibility Class, The Flexibility Class reduces complexity while addressing various workloads at the lowest DS8900F family entry cost. The DS8900F architecture relies on powerful IBM POWER9™ processor based servers that manage the cache to streamline disk input/output (I/O), which maximizes performance and throughput. These capabilities are further enhanced by High Performance Flash Enclosures (HPFE) Gen2. Like its predecessors, the DS8900F supports advanced disaster recovery, DR solutions, business continuity solutions, and thin provisioning.

IBM DS8870 Multiple Target Peer-to-Peer Remote Copy Warren Stanley, IBM Redbooks, 2017-03-28. Multiple Target Peer-to-Peer Remote Copy (MT/PPRC) was introduced with IBM System Storage DS8870 Version 7 Release 4 License Machine Code 7.7.40.xx.xx. MT/PPRC provides the capability to have two PPRC relationships on a single primary volume. With this enhancement, there can be another target available to provide additional data protection to act as a backup if a disaster occurs. This IBM Redpaper™ publication provides practical information about the characteristics and functions of the IBM DS8000 Multiple Target Peer-to-Peer Remote Copy (MT/PPRC). The paper includes scenarios that illustrate the implementation and use of different topologies, as well as enhanced migration scenarios. *IBM*

ProtecTIER Implementation and Best Practices Guide Karen Orlando,Mara Miranda Bautista,Emmanuel Barajas Gonzalez,Carlos A. Martinez Vazquez,IBM Redbooks,2016-08-16 This IBM Redbooks publication provides best practice guidance for planning installing configuring and employing the IBM TS7600 ProtecTIER family of products It provides the latest best practices for the practical application of ProtecTIER Software Version 3 4 This latest release introduces the new ProtecTIER Enterprise Edition TS7650G DD6 model high performance server This book also includes information about the revolutionary and patented IBM HyperFactor deduplication engine along with other data storage efficiency techniques such as compression and defragmentation The IBM System Storage TS7650G ProtecTIER Deduplication Gateway and the IBM System Storage TS7620 ProtecTIER Deduplication Appliance Express are disk based data storage systems The Virtual Tape Library VTL interface is the foundation of ProtecTIER and emulates traditional automated tape libraries For your existing ProtecTIER solution this guide provides best practices and suggestions to boost the performance and the effectiveness of data deduplication with regards to your application platforms for your VTL and FSI systems prior to version 3 4 When you build a ProtecTIER data deduplication environment this guide can help IT architects and solution designers plan for the best option and scenario for data deduplication for their environments This book can help you optimize your deduplication ratio while reducing the hardware power and cooling and management costs This Redbooks publication provides expertise that was gained from an IBM ProtecTIER System Client Technical Specialist CTS Development and Quality Assurance teams This planning should be done by the Sales Representative or IBM Business Partner with the help of an IBM System CTS or IBM Solution Architect

IBM Software Defined Environment Dino Quintero,William M Genovese,KiWaon Kim,Ming Jun MJ Li,Fabio Martins,Ashish Nainwal,Dusan Smolej,Marcin Tabinowski,Ashu Tiwary,IBM Redbooks,2015-08-14 This IBM Redbooks publication introduces the IBM Software Defined Environment SDE solution which helps to optimize the entire computing infrastructure compute storage and network resources so that it can adapt to the type of work required In today s environment resources are assigned manually to workloads but that happens automatically in a SDE In an SDE workloads are dynamically assigned to IT resources based on application characteristics best available resources and service level policies so that they deliver continuous dynamic optimization and reconfiguration to address infrastructure issues Underlying all of this are policy based compliance checks and updates in a centrally managed environment Readers get a broad introduction to the new architecture Think integration automation and optimization Those are enablers of cloud delivery and analytics SDE can accelerate business success by matching workloads and resources so that you have a responsive adaptive environment With the IBM Software Defined Environment infrastructure is fully programmable to rapidly deploy workloads on optimal resources and to instantly respond to changing business demands This information is intended for IBM sales representatives IBM software architects IBM Systems Technology Group brand specialists distributors resellers and anyone who is developing or implementing SDE

IBM System Storage Solutions Handbook Ezgi Coskun,Mikael Lindström,Maciej

Olejniczak, Oliver Stark, Megan Gilge, IBM Redbooks, 2016-07-15 The IBM System Storage Solutions Handbook helps you solve your current and future data storage business requirements It helps you achieve enhanced storage efficiency by design to allow managed cost capacity of growth greater mobility and stronger control over storage performance and management It describes the most current IBM storage products including the IBM Spectrum™ family IBM FlashSystem disk and tape as well as virtualized solutions such IBM Storage Cloud This IBM Redbooks publication provides overviews and information about the most current IBM System Storage products It shows how IBM delivers the right mix of products for nearly every aspect of business continuance and business efficiency IBM storage products can help you store safeguard retrieve and share your data This book is intended as a reference for basic and comprehensive information about the IBM Storage products portfolio It provides a starting point for establishing your own enterprise storage environment This book describes the IBM Storage products as of March 2016

IBM DS8000: High-Performance Flash Enclosure Jeff Cook, IBM Redbooks, 2015-12-09 The high performance flash enclosure HPFE is available for the IBM DS8870 and DS8880 models and offers integration and optimization of flash technology for mission critical performance The HPFE is a Redundant Array of Independent Disks RAID storage enclosure that can support sixteen or thirty 400 GB encryption capable flash cards 1.8 inch 46 mm form factor in a 1U rack space This IBM Redbooks Product Guide describes the IBM DS8000 high performance flash enclosure HPFEs can be installed in the IBM DS8870 and IBM DS8880 storage systems

IBM System Storage DS8000 Performance Monitoring and Tuning Axel Westphal, Bert Dufrasne, Wilhelm Gardt, Jana Jamsek, Peter Kimmel, Flavio Morais, Paulus Usong, Alexander Warmuth, Kenta Yuge, IBM Redbooks, 2016-04-07 This IBM Redbooks publication provides guidance about how to configure monitor and manage your IBM DS8880 storage systems to achieve optimum performance and it also covers the IBM DS8870 storage system It describes the DS8880 performance features and characteristics including hardware related performance features synergy items for certain operating systems and other functions such as IBM Easy Tier and the DS8000 I/O Priority Manager The book also describes specific performance considerations that apply to particular host environments including database applications This book also outlines the various tools that are available for monitoring and measuring I/O performance for different server environments and it describes how to monitor the performance of the entire DS8000 storage system This book is intended for individuals who want to maximize the performance of their DS8880 and DS8870 storage systems and investigate the planning and monitoring tools that are available The IBM DS8880 storage system features as described in this book are available for the DS8880 model family with R8.0 release bundles Licensed Machine Code LMC level 7.8.0

IBM Assist On-site for Storage Overview Juan Brandenburg, Bjoern Wesselbaum, IBM Redbooks, 2015-12-24 This IBM Redpaper™ publication provides a description and reference information for the IBM Assist On site AOS software It is intended for clients who want the benefit of the AOS advanced features such as port forwarding which allows an authorized IBM Support Service Representative IBM SSR to access a client's enabled storage device to diagnose and

troubleshoot efficiently the device **Using IBM DS8000 in an OpenStack Environment** Bert Dufrasne,Axel Westphal,IBM Redbooks,2017-12-28 With the availability of the IBM Storage Driver for OpenStack the IBM DS8000 can offer a range of capabilities that enable more effective storage automation deployments to private or public clouds Enabling OpenStack with DS8000 allows storage to be made available whenever it is needed without the traditional associated cost of highly skilled administrators and infrastructure This IBM Redpaper™ publication explains how to integrate the DS8000 in an OpenStack environment first from the DS8000 Storage Administrator perspective and then from a cloud administrator standpoint This paper also contains practical examples and illustrations of DS8000 functions that can be used with OpenStack as it applies for DS8880 Release 8.3 and the OpenStack Pike release **Mainframe from Scratch: Hardware Configuration and z/OS Build** Keith Winnard,Bertus Bekker,Rafael Carvalho A. Lima,Nilkanth Patwardhan,Zheng Zhao,Hui Zhou,IBM Redbooks,2016-12-22 This IBM Redbooks publication helps you install customize and configure an IBM z13 and build z OS environments This book is intended for those readers who are new to the platform and are faced with the task of installing a mainframe for the first time By the term mainframe in this instance we refer to the hardware and the system software The intention is to show you how this installation can be done Volume 1 shows you how we set up a mainframe and installed z OS V2R2 and IBM DB2 V11 The starting point is a basic hardware configuration of an IBM z13 and DS8000 as shipped from the factory Volume 1 shows you how the following milestones were achieved Creating a configuration for the Customized Offering Driver COD system Stand alone restoration of the COD Expanding the configuration Installing the z OS V2R2 ServerPac Loading and running IVPs for z OS ServerPac Installing DB2 ServerPac and IVPs This publication includes figures that show you how the initial builds were achieved For this book we designed a scenario and show you how to build that scenario step by step Although your requirements likely differ from our scenario we intend to provide you with an example to show you how it can be done and samples and downloadable materials that you can choose to modify to bring you closer to meeting your needs This book is divided into the following parts Part 1 Overview and Planning In this part we introduce you to how we approached the project Part 2 Configuration and builds In this part we describe the tasks that must be completed to create the initial build for the scenario that is described in Part 1 DS8870 Data Migration Techniques Bertrand Dufrasne,Alexander Warmuth,Joachim Appel,Werner Bauer,Susan Douglass,Peter Klee,Mirosław Pura,Mark Wells,Bjoern Wesselbaum,IBM Redbooks,2017-11-16 This IBM Redbooks publication describes data migrations between IBM DS8000 storage systems where in most cases one or more older DS8000 models are being replaced by the newer DS8870 model Most of the migration methods are based on the DS8000 Copy Services The book includes considerations for solutions such as IBM Tivoli Productivity Center for Replication and the IBM Geographically Dispersed Parallel Sysplex™ GDPS used in IBM z OS environments Both offerings are primarily designed to enable a disaster recovery using DS8000 Copy Services In most data migration cases Tivoli Productivity Center for Replication or GDPS will not directly provide functions for the data

migration itself However this book explains how to bring the new migrated environment back into the control of GDPS or Tivoli Productivity Center for Replication In addition to the Copy Services based migrations the book also covers host based mirroring techniques using IBM Transparent Data Migration Facility TDMF for z OS and the z OS Dataset Mobility Facility zDMF

IBM DS8870 Architecture and Implementation Bertrand Dufrasne, Warren Stanley, Andre Candra, Don Skilton, Scott Helmick, Stephen Manthorpe, Jean Iyabi, Sherri Brunson, Artur Borowicz, Peter Kimmel, Abilio De Oliveira, Axel Westphal, Bruce Wilson, 2014 This IBM Redbooks publication describes the concepts architecture and implementation of the IBM DS8870 The book provides reference information to assist readers who need to plan for install and configure the DS8870 The IBM DS8870 is the most advanced model in the IBM DS8000 series and is equipped with IBM POWER7 TM based controllers Various configuration options are available that scale from dual 2 core systems up to dual 16 core systems with up to 1 TB of cache The DS8870 features an integrated high performance flash enclosure with flash cards that can deliver up to 250 000 IOPS and up to 3 4 GBps bandwidth A High Performance All Flash configuration is also available The DS8870 also features enhanced 8 Gbps device adapters and host adapters Connectivity options with up to 128 Fibre Channel IBM FICON ports for host connections make the DS8870 suitable for multiple server environments in open systems and IBM System z environments The DS8870 supports advanced disaster recovery solutions business continuity solutions and thin provisioning All disk drives in the DS8870 storage system have the Full Disk Encryption FDE feature The DS8870 also can be integrated in a Lightweight Directory Access Protocol LDAP infrastructure The DS8870 can automatically optimize the use of each storage tier particularly flash drives and flash cards through the IBM Easy Tier feature which is available at no extra charge This edition applies to Version 7 release 4 of IBM DS8870

IBM DS8900F Performance Best Practices and Monitoring Peter Kimmel, Sherri Brunson, Lisa Martinez, Luiz Fernando Moreira, Ewerson Palacio, Rick Pekosh, Ali Rizvi, Paul Smith, IBM Redbooks, 2021-12-17 This IBM Redbooks publication is intended for individuals who want to maximize the performance of their DS8900 storage systems and investigate the planning and monitoring tools that are available

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