I O Consolidation In The Data Center A Complete Guide To Data Center Ethernet And Fibre Channel Over Ethernet

This is the eBook version of the print title. Note that the eBook does not provide access to the practice test software that accompanies the print book. Access to the personal video mentoring is available through product registration at Cisco Press; or see the instructions in the back pages of your eBook. Learn, prepare, and practice for CCNP/CCIE Data Center Core DCCOR 350-601 exam success with this Cert Guide from Cisco Press, a leader in IT certification learning and the only self-study resource approved by Cisco. · Master CCNP/CCIE Data Center Core DCCOR 350-601 exam topics · Assess your knowledge with chapter-ending quizzes · Review key concepts with exam preparation tasks · Learn from more than two hours of video mentoring CCNP and CCIE Data Center Core DCCOR 350-601 Official Cert Guide is a best-of-breed exam study guide. Expert authors Somit Maloo and Firas Ahmed share preparation hints and test-taking tips, helping you identify areas of weakness and improve both your conceptual knowledge and hands-on skills. Material is presented in a concise manner, focusing on increasing your understanding and retention of exam topics. The book presents you with an organized test-preparation routine through the use of proven series elements and techniques. Exam topic lists make referencing easy. Chapter-ending Exam Preparation Tasks help you drill on key concepts you must know thoroughly. Review questions help you assess your knowledge, and a final preparation chapter

guides you through tools and resources to help you craft your final study plan. The book also contains more than two hours of personal video mentoring from the Pearson IT Certification Complete Video Course. Go to the back pages of your eBook for instructions on how to access the personal video mentoring content. Well regarded for its level of detail, assessment features, and challenging review questions and exercises, this study guide helps you master the concepts and techniques that will help you succeed on the exam the first time. This official study guide helps you master all the topics on the CCNP/CCIE Data Center Core DCCOR 350-601 exam, including · Network · Compute · Storage Network · Automation · Security

This IBM® Redbooks® product guide describes the IBM Storage Networking SAN64B-6 switch. cloud infrastructures and growing flash-based storage environments by delivering market-leading Gen 6 Fibre Channel technology and capabilities. SAN64B-6 delivers unmatched 32/128 gigabits per second (Gbps) performance, industry-leading port density, and built-in instrumentation to accelerates data access, drive always-on business, and support data center consolidation in small to large-scale enterprise infrastructures. A resilient storage network is an environment where data is always available for the needs of the business. This book explains the components, as well as how to design and implement a resilient storage network for workgroup, departmental, and enterprise environments. Storage networks are an enabling capability combining technology and best practices to provide the foundation to support information technology systems and applications. Storage networks can be of various sizes, shapes, and technologies. This book shows you how to implement a resilient storage network infrastructure using different technologies including ATM, DWDM, FCIP, Fibre Channel, FICON, iFCP, InfiniBand, IP,

iSCSI, Life Cycle Management, NAS, Object Based Storage, RAID, RDMA, Remote Mirroring, Replication, SAN, SCSI, SMI-S, SONET/SDH, Storage Services, Tape, Virtualization, and Volume Managers. *Important information is clarified and put into context to separate myths and realities *Covers storage networking technologies (hardware, software, networks) and practices *Numerous tips and recommendations allow the reader to quickly understand best practices *Checklists, templates and examples show potential solutions

Today, software engineers need to know not only how to program effectively but also how to develop proper engineering practices to make their codebase sustainable and healthy. This book emphasizes this difference between programming and software engineering. How can software engineers manage a living codebase that evolves and responds to changing requirements and demands over the length of its life? Based on their experience at Google, software engineers Titus Winters and Hyrum Wright, along with technical writer Tom Manshreck, present a candid and insightful look at how some of the world's leading practitioners construct and maintain software. This book covers Google's unique engineering culture, processes, and tools and how these aspects contribute to the effectiveness of an engineering organization. You'll explore three fundamental principles that software organizations should keep in mind when designing, architecting, writing, and maintaining code: How time affects the sustainability of software and how to make your code resilient over time How scale affects the viability of software practices within an engineering organization What trade-offs a typical engineer needs to make when evaluating design and development decisions

This IBM® RedpaperTM publication is a comprehensive

guide covering the IBM Power 770 (9117-MMC) and Power 780 (9179-MHC) servers supporting IBM AIX®, IBM i, and Linux operating systems. The goal of this paper is to introduce the major innovative Power 770 and 780 offerings and their prominent functions, including: The IBM POWER7TM processor available at frequencies of 3.3 GHz, 3.44 GHz, 3.72 GHz, and 3.92 GHz, and 4.14 GHz The specialized IBM POWER7TM Level 3 cache that provides greater bandwidth, capacity, and reliability The 1 Gb or 10 Gb Integrated Multifunction Card provides two USB ports, one serial port, and four Ethernet connectors for a processor enclosure and does not require a PCI slot The new Active MemoryTM Mirroring (AMM) for Hypervisor feature that mirrors the main memory used by the firmware IBM PowerVMTM virtualization including PowerVM Live Partition Mobility and PowerVM Active MemoryTM Sharing Active Memory Expansion that provides more usable memory than what is physically installed on the system IBM EnergyScaleTM technology that provides features such as power trending, power-saving, capping of power, and thermal measurement Enterprise-ready reliability, serviceability, and availability Professionals who want to acquire a better understanding of IBM Power SystemsTM products should read this paper. This paper expands the current set of IBM Power Systems documentation by providing a desktop reference that offers a detailed technical description of the 770 and 780 systems. This paper does not replace the latest marketing materials and configuration tools. It is intended as an additional source of information that, together with existing sources, can be used to enhance your knowledge of IBM server solutions.

to follow

First Published in 1996. Routledge is an imprint of Taylor & Francis, an informa company.

Collects and unifies the author's and the co-authors' research papers on national accounting, input-output coefficients, economic theory, dynamic models, stochastic analysis, and performance analysis.

This publication is an assemblage of selected papers that have been authored or co-authored by D.G. Fredlund. The substance of these papers documents the milestones of both the science of unsaturated soil mechanincs and the career of the author during his tenure as a faculty member in the Department of Civil Engineering at the University of Saskatchewan, Saskatoon, Canada.

Presents design strategies, operational approaches, and technologies to help data centers improve energy efficiency and become eco-friendly.

Data Center Virtualization Fundamentals For many IT organizations, today's greatest challenge is to drive more value, efficiency, and utilization from data centers. Virtualization is the best way to meet this challenge. Data Center Virtualization Fundamentals brings together the comprehensive knowledge Cisco professionals need to apply virtualization throughout their data center environments. Leading data center expert Gustavo A. A. Santana thoroughly explores all components of an end-to-end data center virtualization solution, including networking, storage, servers, operating systems, application optimization, and security. Rather than focusing on a single product or technology, he explores product capabilities as interoperable design tools that can be combined and integrated with other solutions, including VMware vSphere. With the author's guidance, you'll learn how to define and implement highly-efficient architectures for new, expanded, or retrofit data center projects. By doing so, you can deliver agile application provisioning without purchasing unnecessary infrastructure, and establish a strong foundation for new cloud computing

and IT-as-a-service initiatives. Throughout, Santana illuminates key theoretical concepts through realistic use cases, real-world designs, illustrative configuration examples, and verification outputs. Appendixes provide valuable reference information, including relevant Cisco data center products and CLI principles for IOS and NX-OS. With this approach, Data Center Virtualization Fundamentals will be an indispensable resource for anyone preparing for the CCNA Data Center, CCNP Data Center, or CCIE Data Center certification exams. Learn how virtualization can transform and improve traditional data center network topologies Understand the key characteristics and value of each data center virtualization technology Walk through key decisions, and transform choices into architecture Smoothly migrate existing data centers toward greater virtualization Burst silos that have traditionally made data centers inefficient Master foundational technologies such as VLANs, VRF, and virtual contexts Use virtual PortChannel and FabricPath to overcome the limits of STP Optimize cabling and network management with fabric extender (FEX) virtualized chassis Extend Layer 2 domains to distant data center sites using MPLS and Overlay Transport Virtualization (OTV) Use VSANs to overcome Fibre Channel fabric challenges Improve SAN data protection, environment isolation, and scalability Consolidate I/O through Data Center Bridging and FCoE Use virtualization to radically simplify server environments Create server profiles that streamline "bare metal" server provisioning "Transcend the rack" through virtualized networking based on Nexus 1000V and VM-FEX Leverage opportunities to deploy virtual network services more efficiently Evolve data center virtualization toward full-fledged private clouds

This IBM® RedpaperTM publication describes the concepts and functions of the IBM System Storage® DS8000® I/O Priority Manager. The DS8000 I/O Priority Manager enables

more effective storage consolidation and performance management combined with the ability to align quality of service (QoS) levels to separate workloads in the system. With DS8000 I/O Priority Manager, the system can prioritize access to system resources to achieve the volume's desired QoS based on defined performance goals (high, medium, or low) of any volume. I/O Priority Manager constantly monitors and balances system resources to help applications meet their performance targets automatically, without operator intervention. Starting with DS8000 Licensed Machine Code (LMC) level R6.2, the DS8000 I/O Priority Manager feature supports open systems and IBM System z®. DS8000 I/O Priority Manager, together with IBM z/OS® Workload Manager (WLM), provides more effective storage consolidation and performance management for System z systems. Now tightly integrated with Workload Manager for z/OS, DS8000 I/O Priority Manager improves disk I/O performance for important workloads. It also drives I/O prioritization to the disk system by allowing WLM to give priority to the system's resources automatically when higher priority workloads are not meeting their performance goals. Integration with zWLM is exclusive to DS8000 and System z systems. The paper is aimed at those who want to get an understanding of the DS8000 I/O Priority Manager concept and its underlying design. It provides guidance and practical illustrations for users who want to exploit the capabilities of the DS8000 I/O Priority Manager.

This Descriptor List is published as a companion to the International Bibliography of the Social Sciences. First published in 1952, the IBSS is produced annually in four parts - Anthropology, Economics, Political Science, Sociology - and has been widely acclaimed as an essential tool for librarians, university departments, research institutions, public and private institutions, and indeed for all whose work requires

reference to the current literature in any of the fields comprised within its scope. Companion Descriptor lists are now available for all four main subject areas. All volumes of the IBSS published to date have been indexed and from this a language representing every subject covered in this massive bibliography has been developed. This language can be used for indexing social science publications as well as for retrieving the references stored in the IBSS data bank. The Descriptor List falls into two parts: alphabetical and thematic. In the alphabetic section, terms appear both in English and French. Cross reference is made to all four volumes of the IBSS. The thematic section corresponds to the relevant volume of the four IBSS volumes. It follows the classification of the volume and quotes the indexation terms appropriate to the entries. This Descriptor List is not a thesaurus, although it has a thematic arrangement that allows for the regrouping of information. Fundamentally, it meets the practical needs of those contributing to the development of information systems in The Social Sciences. It will be an essential tool for all those to whom the IBSS has been a key source of reference since 1952.

The definitive guide to UCS and the Cisco® Data Center Server: planning, architecture, components, deployment, and benefits With its new Unified Computing System (UCS) family of products, Cisco has introduced a fundamentally new vision for data center computing: one that reduces ownership cost, improves agility, and radically simplifies management. In this book, three Cisco insiders thoroughly explain UCS, and offer practical insights for IT professionals and decision-makers who are evaluating or implementing it. The authors establish the context for UCS by discussing the implications of virtualization, unified I/O, large memories and other key technologies, and showing how trends like cloud computing and green IT will drive the next-generation data center. Next,

they take a closer look at the evolution of server CPU, memory, and I/O subsystems, covering advances such as the Intel® XEON® 5500, 5600, 7500, DDR3 memory, and unified I/O over 10 Gbps Ethernet. Building on these fundamentals, the authors then discuss UCS in detail, showing how it systematically overcomes key limitations of current data center environments. They review UCS features, components, and architecture, and demonstrate how it can improve data center performance, reliability, simplicity, flexibility, and energy efficiency. Along the way, they offer realistic planning, installation, and migration guidance: everything decision-makers and technical implementers need to gain maximum value from UCS–now, and for years to come. Silvano Gai has spent 11 years as Cisco Fellow, architecting Catalyst®, MDS, and Nexus switches. He has written several books on networking, written multiple Internet Drafts and RFCs, and is responsible for 80 patents and applications. He teaches a course on this book's topics at Stanford University. Tommi Salli, Cisco Technical Marketing Engineer, has nearly 20 years of experience with servers and applications at Cisco, Sun, VERITAS, and Nuova Systems. Roger Andersson, Cisco Manager, Technical Marketing, spent more than 12 years in the CLARiiON® Engineering Division at EMC, and 5 years as Technical Product Manager at VERITAS/Symantec. He is now focused on Cisco UCS system management. Streamline data centers with UCS to systematically reduce cost of ownership Eliminate unnecessary server components–and their setup, management, power, cooling, and cabling Use UCS to scale service delivery, simplify service movement, and improve agility Review the latest advances in processor, memory, I/O, and virtualization architectures for data center servers Understand the specific technical advantages of UCS Integrate UCS 6100 Fabric Interconnect, Cisco UCS 2100

Series Fabric Extenders, UCS 5100 Series Blade Server
Enclosures, UCS B-Series Blade Servers, UCS C-Series
Rack Servers, and UCS Adapters Use Cisco UCS Manager
to manage all Cisco UCS components as a single, seamless
entity Integrate third-party management tools from companies
like BMC®, CA®, EMC®, IBM®, Microsoft®, and VMware®
Practice all this with a copy of Cisco Unified Computing
System™ Platform Emulator Lite (UCSPE Lite) on the DVD in
the back of the book This book is part of the Networking
Technology Series from Cisco Press®, which offers
networking professionals valuable information for constructing
efficient networks, understanding new technologies, and
building successful careers.

The superabundance of data that is created by today's
businesses is making storage a strategic investment
priority for companies of all sizes. As storage takes
precedence, the following major initiatives emerge:
Flatten and converge your network: IBM® takes an
open, standards-based approach to implement the latest
advances in the flat, converged data center network
designs of today. IBM Storage solutions enable clients to
deploy a high-speed, low-latency Unified Fabric
Architecture. Optimize and automate virtualization:
Advanced virtualization awareness reduces the cost and
complexity of deploying physical and virtual data center
infrastructure. Simplify management: IBM data center
networks are easy to deploy, maintain, scale, and
virtualize, delivering the foundation of consolidated
operations for dynamic infrastructure management.
Storage is no longer an afterthought. Too much is at
stake. Companies are searching for more ways to
efficiently manage expanding volumes of data, and to

make that data accessible throughout the enterprise. This demand is propelling the move of storage into the network. Also, the increasing complexity of managing large numbers of storage devices and vast amounts of data is driving greater business value into software and services. With current estimates of the amount of data to be managed and made available increasing at 60% each year, this outlook is where a storage area network (SAN) enters the arena. SANs are the leading storage infrastructure for the global economy of today. SANs offer simplified storage management, scalability, flexibility, and availability; and improved data access, movement, and backup. Welcome to the cognitive era. The smarter data center with the improved economics of IT can be achieved by connecting servers and storage with a high-speed and intelligent network fabric. A smarter data center that hosts IBM Storage solutions can provide an environment that is smarter, faster, greener, open, and easy to manage. This IBM® Redbooks® publication provides an introduction to SAN and Ethernet networking, and how these networks help to achieve a smarter data center. This book is intended for people who are not very familiar with IT, or who are just starting out in the IT world.

Fundamentals of Continuum Mechanics of Soils provides a long-needed general scheme for the study of the important yet problematic material of soil. It closes the gap between two disciplines, soil mechanics and con- tinuum mechanics, showing that the familiar concepts of soil mechanics evolve directly from continuum mechanics. It confirms concepts such as pore pressures,

cohesion and dependence of the shear stress on consolidation, and rejects the view that continuum mechanics cannot be applied to a material such as soil. The general concepts of continuum mechanics, field equations and constitutive equations are discussed. It is shown how the theory of mixtures evolves from these equations and how, along with energetics and irreversible thermodynamics, it can be applied to soils. The discussion also sheds light on some aspects of mechanics of materials, especially compressible materials. Examples are the introduction of the Hencky measure of strain, the requirement of dual constitutive equations, and the dependence of the spent internal energy on the stored internal energy. Researchers in engineering mechanics and material sciences may find that the results of experiments on soils can be generalized and extended to other materials. The book is a reference text for students familiar with the fundamentals of mechanics, for scholars of soil engineering, and for soil scientists. It is also suitable as an advanced undergraduate course in soil mechanics. The Green and Virtual Data Center sets aside the political aspects of what is or is not considered green to instead focus on the opportunities for organizations that want to sustain environmentally-friendly economical growth. If you are willing to believe that IT infrastructure resources deployed in a highly virtualized manner can be combined with other technologies to achieve simplified and cost-effective delivery of services in a green, profitable manner, this book is for you. Savvy industry veteran Greg Schulz provides real-world insight,

addressing best practices, server, software, storage,
networking, and facilities issues concerning any current
or next-generation virtual data center that relies on
underlying physical infrastructures. Coverage includes:
Energy and data footprint reduction Cloud-based storage
and computing Intelligent and adaptive power
management Server, storage, and networking
virtualization Tiered servers and storage, network, and
data centers Energy avoidance and energy efficiency
Many current and emerging technologies can enable a
green and efficient virtual data center to support and
sustain business growth with a reasonable return on
investment. This book presents virtually all critical IT
technologies and techniques to discuss the
interdependencies that need to be supported to enable a
dynamic, energy-efficient, economical, and
environmentally-friendly green IT data center. This is a
path that every organization must ultimately follow. Take
a tour of the Green and Virtual Data Center website.
CRC Press is pleased to announce that The Green and
Virtual Data Center has been added to Intel
Corporation's Recommended Reading List. Intel's
Recommended Reading program provides technical
professionals a simple and handy reference list of what
to read to stay abreast of new technologies. Dozens of
industry technologists, corporate fellows, and engineers
have helped by suggesting books and reviewing the list.
This is the most comprehensive reading list available for
professional computer developers.
Cisco® Nexus switches and the new NX-OS operating
system are rapidly becoming the new de facto standards

for data center distribution/aggregation layer networking. NX-OS builds on Cisco IOS to provide advanced features that will be increasingly crucial to efficient data center operations. NX-OS and Cisco Nexus Switching is the definitive guide to utilizing these powerful new capabilities in enterprise environments. In this book, three Cisco consultants cover every facet of deploying, configuring, operating, and troubleshooting NX-OS in the data center. They review the key NX-OS enhancements for high availability, virtualization, In-Service Software Upgrades (ISSU), and security. In this book, you will discover support and configuration best practices for working with Layer 2 and Layer 3 protocols and networks, implementing multicasting, maximizing serviceability, providing consistent network and storage services, and much more. The authors present multiple command-line interface (CLI) commands, screen captures, realistic configurations, and troubleshooting tips—all based on their extensive experience working with customers who have successfully deployed Nexus switches in their data centers. Learn how Cisco NX-OS builds on and differs from IOS Work with NX-OS user modes, management interfaces, and system files Configure Layer 2 networking: VLANs/private VLANs, STP, virtual port channels, and unidirectional link detection Configure Layer 3 EIGRP, OSPF, BGP, and First Hop Redundancy Protocols (FHRPs) Set up IP multicasting with PIM, IGMP, and MSDP Secure NX-OS with SSH, Cisco TrustSec, ACLs, port security, DHCP snooping, Dynamic ARP inspection, IP Source Guard, keychains, Traffic Storm Control, and more Build high

availability networks using process modularity and restart, stateful switchover, nonstop forwarding, and in-service software upgrades Utilize NX-OS embedded serviceability, including Switched Port Analyzer (SPAN), Smart Call Home, Configuration Checkpoint/Rollback, and NetFlow Use the NX-OS Unified Fabric to simplify infrastructure and provide ubiquitous network and storage services Run NX-OS on Nexus 1000V server-based software switches This book is part of the Networking Technology Series from Cisco Press®, which offers networking professionals valuable information for constructing efficient networks, understanding new technologies, and building successful careers.

Using Fibre Channel over Ethernet (FCoE) and related technologies, data centers can consolidate data traffic onto a single network switch, simplifying their environments, promoting virtualization, and substantially reducing power and cooling costs. This emerging technology is drawing immense excitement, but few enterprise IT decision-makers and implementers truly understand it. I/O Consolidation in the Data Center is the only complete, up-to-date guide to FCoE. FCoE innovators Silvano Gai and Claudio DeSanti (chair of the T11 FCoE standards working group) systematically explain the technology: its benefits, tradeoffs, and what it will take to implement it successfully in production environments. Unlike most other discussions of FCoE, this book fully reflects the final, recently-approved industry standard. The authors also present five detailed case studies illustrating typical FCoE adoption scenarios,

as well as an extensive Q and A section addressing the issues enterprise IT professionals raise most often. This is a fully updated version of Silvano Gai's privately-published book on FCoE, written for leading FCoE pioneer Nuova Systems before the company was acquired by Cisco. Nearly 12,000 copies of that book have already been distributed, demonstrating the immense interest in FCoE technology, and the scarcity of reliable information that has existed about it. This IBM® RedpaperTM publication is a comprehensive guide covering the IBM Power 770 (9117-MMD) and Power 780 (9179-MHD) servers that support IBM AIX®, IBM i, and Linux operating systems. The goal of this paper is to introduce the major innovative Power 770 and 780 offerings and their prominent functions: The IBM POWER7+TM processor, available at frequencies of 3.8 GHz and 4.2 GHz for the Power 770 and 3.7 GHz and 4.4 GHz for the Power 780 The specialized IBM POWER7+ Level 3 cache that provides greater bandwidth, capacity, and reliability The 1 Gb or 10 Gb Integrated Multifunction Card that provides two USB ports, one serial port, and four Ethernet connectors for a processor enclosure and does not require a PCI slot The Active MemoryTM Mirroring (AMM) for Hypervisor feature that mirrors the main memory used by the firmware IBM PowerVM® virtualization, including PowerVM Live Partition Mobility and PowerVM Active Memory Sharing Active Memory Expansion that provides more usable memory than what is physically installed on the system IBM EnergyScaleTM technology that provides features such as power trending, power-saving,

capping of power, and thermal measurement Enterprise-ready reliability, serviceability, and availability Dynamic Platform Optimizer High-performance SSD drawer Professionals who want to acquire a better understanding of IBM Power SystemsTM products can benefit from reading this paper.

This IBM® RedpaperTM publication is a comprehensive guide covering the IBM Power 710 and Power 730 servers supporting AIX®, IBM i, and Linux® operating systems. The goal of this paper is to introduce the major innovative Power 710 and 730 offerings and their prominent functions, including these: The POWER7TM processor available at frequencies of 3.0 GHz, 3.55 GHz, and 3.7 GHz The specialized POWER7 Level 3 cache that provides greater bandwidth, capacity, and reliability The 1 Gb or 10 Gb Integrated Virtual Ethernet adapter, included with each server configuration, and providing native hardware virtualization PowerVMTM virtualization including PowerVM Live Partition Mobility and PowerVM Active MemoryTM Sharing Active Memory Expansion that provides more usable memory than what is physically installed on the system EnergyScaleTM technology that provides features such as power trending, power-saving, capping of power, and thermal measurement. Professionals who want to acquire a better understanding of IBM Power Systems products can benefit from reading this paper. This paper expands the current set of IBM Power Systems documentation by providing a desktop reference that offers a detailed technical description of the Power 710 and Power 730 systems. This paper does not replace the latest

marketing materials and configuration tools. It is intended as an additional source of information that, together with existing sources, can be used to enhance your knowledge of IBM server solutions.

This IBM® RedpaperTM publication is a comprehensive guide covering the IBM Power 720 and Power 740 servers supporting AIX®, IBM i, and Linux® operating systems. The goal of this paper is to introduce the major innovative Power 720 and 740 offerings and their prominent functions, including these: The POWER7TM processor available at frequencies of 3.0 GHz, 3.55 GHz, and 3.7 GHz The specialized POWER7 Level 3 cache that provides greater bandwidth, capacity, and reliability The 1 Gb or 10 Gb Integrated Virtual Ethernet adapter, included with each server configuration, and providing native hardware virtualization The latest PowerVMTM virtualization including PowerVM Live Partition Mobility and PowerVM Active MemoryTM Sharing. Active Memory Expansion that provides more usable memory than what is physically installed on the system EnergyScaleTM technology that provides features such as power trending, power-saving, capping of power, and thermal measurement. Professionals who want to acquire a better understanding of IBM Power Systems products can benefit from reading this paper. This paper expands the current set of IBM Power Systems documentation by providing a desktop reference that offers a detailed technical description of the Power 720 and Power 740 systems. This paper does not replace the latest marketing materials and configuration tools. It is intended as an additional source of information that, together with existing sources, can be used to enhance your knowledge of IBM server solutions.

Master the basics of data centers to build server farms that enhance your Web site performance Learn design guidelines

that show how to deploy server farms in highly available and scalable environments Plan site performance capacity with discussions of server farm architectures and their real-life applications to determine your system needs Today's market demands that businesses have an Internet presence through which they can perform e-commerce and customer support, and establish a presence that can attract and increase their customer base. Underestimated hit ratios, compromised credit card records, perceived slow Web site access, or the infamous "Object Not Found" alerts make the difference between a successful online presence and one that is bound to fail. These challenges can be solved in part with the use of data center technology. Data centers switch traffic based on information at the Network, Transport, or Application layers. Content switches perform the "best server" selection process to direct users' requests for a specific service to a server in a server farm. The best server selection process takes into account both server load and availability, and the existence and consistency of the requested content. Data Center Fundamentals helps you understand the basic concepts behind the design and scaling of server farms using data center and content switching technologies. It addresses the principles and concepts needed to take on the most common challenges encountered during planning, implementing, and managing Internet and intranet IP-based server farms. An in-depth analysis of the data center technology with real-life scenarios make Data Center Fundamentals an ideal reference for understanding, planning, and designing Web hosting and e-commerce environments.

The construction materials industry is a major user of the world's resources. While enormous progress has been made towards sustainability, the scope and opportunities for improvements are significant. To further the effort for sustainable development, a conference on Sustainable

Construction Materials and Technologies was held at Coventry University, Coventry, U.K., from June 11th - 13th, 2007, to highlight case studies and research on new and innovative ways of achieving sustainability of construction materials and technologies. This book presents selected, important contributions made at the conference. Over 190 papers from over 45 countries were accepted for presentation at the conference, of which approximately 100 selected papers are published in this book. The rest of the papers are published in two supplementary books. Topics covered in this book include: sustainable alternatives to natural sand, stone, and Portland cement in concrete; sustainable use of recyclable resources such as fly ash, ground municipal waste slag, pozzolan, rice-husk ash, silica fume, gypsum plasterboard (drywall), and lime in construction; sustainable mortar, concrete, bricks, blocks, and backfill; the economics and environmental impact of sustainable materials and structures; use of construction and demolition wastes, and organic materials (straw bale, hemp, etc.) in construction; sustainable use of soil, timber, and wood products; and related sustainable construction and rehabilitation technologies.

All you need to know about Storage Area Networks The amount of data of an average company doubles every year. Thus, companies who own 1TB of data today will own 32TB in five years. Storage networks help to tame such data quantities and to manage this data growth efficiently. Since stored data and information are the biggest asset of any company, anyone who is involved in the planning or the operation of IT systems requires a basic knowledge of the principle and the use of storage networks. Storage Networks Explained covers the fundments, techniques and functions of storage networks such as disk subsystems, Fibre Channel SAN, Internet SCSI (iSCSI), Fibre Channel over Ethernet

(FCoE), Network Attached Storage (NAS), file systems, and storage virtualization. Furthermore the authors describe the use of these techniques and how they are designed to achieve high-availability, flexibility, and scalability of data and applications. Additional attention is given to network backup and the management of storage networks. Written by leading experts in the field, this book on storage area networks is updated and fully revised. Key features: Presents the basic concepts of storage networks, such as I/O techniques, disk subsystems, virtualization, NAS and SAN file systems Covers the design of storage networks which provide flexible, highly-available, and scaleable IT systems Explains the use of storage networks for data sharing, data protection, and digital archiving Discusses management of storage networks using SNMP, SMI-S, and IEEE 1244 This book provides system administrators and system architects, as well as students and decision makers, with the tools needed for optimal selection and cost-effective use of storage networks. The Linux Journal awarded the first edition with the "Editor's Choice Award 2005" in the category "System Administration Book."

In the past twenty-five years, a number of countries have made the transition to democracy. The support of international organizations is essential to success on this difficult path. Yet, despite extensive research into the relationship between democratic transitions and membership in international organizations, the mechanisms underlying the relationship remain unclear. With Organizing Democracy, Paul Poast and Johannes Urpelainen argue that leaders of transitional democracies often have to draw on the support of international organizations to provide the public goods and expertise needed to consolidate democratic rule. Looking at the Baltic states' accession to NATO, Poast and Urpelainen provide a compelling and statistically rigorous account of the sorts of support transitional democracies draw from

international institutions. They also show that, in many cases, the leaders of new democracies must actually create new international organizations to better serve their needs, since they may not qualify for help from existing ones.

Russia today represents one of the major examples of the phenomenon of "electoral authoritarianism" which is characterized by adopting the trappings of democratic institutions (such as elections, political parties, and a legislature) and enlisting the service of the country's essentially authoritarian rulers. Why and how has the electoral authoritarian regime been consolidated in Russia? What are the mechanisms of its maintenance, and what is its likely future course? This book attempts to answer these basic questions. Vladimir Gel'man examines regime change in Russia from the collapse of the Soviet Union in 1991 to the present day, systematically presenting theoretical and comparative perspectives of the factors that affected regime changes and the authoritarian drift of the country. After the fall of the Soviet Union, Russia's national political elites aimed to achieve their goals by creating and enforcing of favorable "rules of the game" for themselves and maintaining informal winning coalitions of cliques around individual rulers. In the 1990s, these moves were only partially successful given the weakness of the Russian state and troubled post-socialist economy. In the 2000s, however, Vladimir Putin rescued the system thanks to the combination of economic growth and the revival of the state capacity he was able to implement by imposing a series of non-democratic reforms. In the 2010s, changing conditions in the country have presented new risks and challenges for the Putin regime that will play themselves out in the years to come.

Transformation of Education Policy deals with internalization processes in education policy and their impact on national policy making. It investigates national responses to the PISA

study for secondary education and the Bologna study for tertiary education.

This IBM® RedpaperTM publication is a comprehensive guide covering the IBM Power 720 and Power 740 servers that support IBM AIX®, IBM i, and Linux operating systems. The goal of this paper is to introduce the innovative Power 720 and Power 740 offerings and their major functions: The IBM POWER7+TM processor is available at frequencies of 3.6 GHz, and 4.2 GHz. The larger IBM POWER7+ Level 3 cache provides greater bandwidth, capacity, and reliability. The 4-port 10/100/1000 Base-TX Ethernet PCI Express adapter is included in base configuration and installed in a PCIe Gen2 x4 slot. The integrated SAS/SATA controller for HDD, SSD, tape, and DVD supports built-in hardware RAID 0, 1, and 10. New IBM PowerVM® V2.2.2 features, such as 20 LPARs per core. The improved IBM Active MemoryTM Expansion technology provides more usable memory than is physically installed in the system. High-performance SSD drawer. Professionals who want to acquire a better understanding of IBM Power SystemsTM products can benefit from reading this paper. This paper expands the current set of IBM Power Systems documentation by providing a desktop reference that offers a detailed technical description of the Power 720 and Power 740 systems. This paper does not replace the latest

marketing materials and configuration tools. It is intended as an additional source of information that, together with existing sources, can be used to enhance your knowledge of IBM server solutions. The amount of data being generated, processed, and stored has reached unprecedented levels. Even during the recent economic crisis, there has been no slow down or information recession. Instead, the need to process, move, and store data has only increased. Consequently, IT organizations are looking to do more with what they have while supporting gr

This volume comprises the select proceedings of the annual convention of the Computer Society of India. Divided into 10 topical volumes, the proceedings present papers on state-of-the-art research, surveys, and succinct reviews. The volumes cover diverse topics ranging from communications networks to big data analytics, and from system architecture to cyber security. This volume focuses on Big Data Analytics. The contents of this book will be useful to researchers and students alike.

For many researchers, Python is a first-class tool mainly because of its libraries for storing, manipulating, and gaining insight from data. Several resources exist for individual pieces of this data science stack, but only with the Python Data Science Handbook do you get them all—IPython, NumPy, Pandas, Matplotlib, Scikit-Learn, and other related

tools. Working scientists and data crunchers familiar with reading and writing Python code will find this comprehensive desk reference ideal for tackling day-to-day issues: manipulating, transforming, and cleaning data; visualizing different types of data; and using data to build statistical or machine learning models. Quite simply, this is the must-have reference for scientific computing in Python. With this handbook, you'll learn how to use: IPython and Jupyter: provide computational environments for data scientists using Python NumPy: includes the ndarray for efficient storage and manipulation of dense data arrays in Python Pandas: features the DataFrame for efficient storage and manipulation of labeled/columnar data in Python Matplotlib: includes capabilities for a flexible range of data visualizations in Python Scikit-Learn: for efficient and clean Python implementations of the most important and established machine learning algorithms This book focuses on the core question of the necessary architectural support provided by hardware to efficiently run virtual machines, and of the corresponding design of the hypervisors that run them. Virtualization is still possible when the instruction set architecture lacks such support, but the hypervisor remains more complex and must rely on additional techniques. Despite the focus on architectural support in current architectures, some historical perspective is necessary to appropriately

frame the problem. The first half of the book provides the historical perspective of the theoretical framework developed four decades ago by Popek and Goldberg. It also describes earlier systems that enabled virtualization despite the lack of architectural support in hardware. As is often the case, theory defines a necessary—but not sufficient—set of features, and modern architectures are the result of the combination of the theoretical framework with insights derived from practical systems. The second half of the book describes state-of-the-art support for virtualization in both x86-64 and ARM processors. This book includes an in-depth description of the CPU, memory, and I/O virtualization of these two processor architectures, as well as case studies on the Linux/KVM, VMware, and Xen hypervisors. It concludes with a performance comparison of virtualization on current-generation x86- and ARM-based systems across multiple hypervisors.

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