

# Data Access For Highly Scalable Solutions Using Sql Nosql And Polyglot Persistence Microsoft Patterns Practices

Data Access For Highly Scalable Solutions Using Sql Nosql And Polyglot Persistence Microsoft Patterns Practices Scaling Your Data Access A Polyglot Persistence Approach with SQL NoSQL and Microsoft Best Practices Building highly scalable solutions requires a sophisticated approach to data management Relying solely on a single database technology whether SQL or NoSQL often proves to be a bottleneck as your application grows This is where the power of polyglot persistence comes in This blog post dives deep into leveraging SQL NoSQL and Microsofts recommended patterns and practices to create truly scalable data access strategies Well explore practical examples offer howto guidance and answer your burning questions

**SEO Data Access Scalability Polyglot Persistence SQL NoSQL Microsoft Patterns Practices Database Strategy Cloud Databases Microservices**

**Understanding the Need for Polyglot Persistence** Imagine your application needs to handle millions of user profiles each with a complex relationship to their activity history purchase records and social interactions A purely relational SQL database might struggle with the sheer volume of data and the complexity of joining tables for realtime insights Conversely a purely NoSQL solution while excellent for handling large volumes of unstructured data may lack the transactional consistency and ACID properties crucial for certain operations This is where the elegance of polyglot persistence shines By strategically combining SQL and NoSQL databases you can leverage the strengths of each to address specific needs

**SQL Databases** eg SQL Server Azure SQL Database Ideal for structured data requiring ACID properties complex relationships and strong consistency Perfect for transactional data like financial records or order management

**NoSQL Databases** eg Cosmos DB MongoDB Cassandra Best suited for large volumes of unstructured or semistructured data high write throughput and horizontal scalability Excellent for user profiles session data or realtime analytics

**Visual Representation 2 Application** SQL Database Order Management NoSQL Database User Profiles Caching Layer Redis This diagram showcases a typical architecture employing both SQL and NoSQL databases complemented by a caching layer for improved performance

**Implementing Polyglot Persistence with Microsoft Technologies** Microsoft offers a rich ecosystem of tools and services ideal for implementing polyglot persistence Heres a practical example leveraging Azure services

**Scenario** An ecommerce application needing to manage product catalogs user accounts and order history

**SQL Database** Azure SQL Database Used for the transactional order processing system This ensures data integrity and

consistency for financial transactions Schema is carefully designed for optimal query performance NoSQL Database Azure Cosmos DB Chosen for storing user profiles and product catalogs Cosmos DBs scalability and flexibility handle large volumes of user data and dynamic product information effectively Schema flexibility allows for easy evolution of data models Caching Azure Redis Cache Frequently accessed data like product prices and user profiles are cached to minimize database hits and improve application responsiveness

HowTo Connecting to Different Databases in C Using Entity Framework Core you can seamlessly connect to both SQL and NoSQL databases within your NET application Heres a simplified example illustrating the concept

```
csharp SQL Context Azure SQL Database public class OrderDbContext DbContext public DbSet Orders get set other configurations NoSQL Context Azure Cosmos DB 3 public class UserDbContext DbContext public DbSet Users get set other configurations including Cosmos DB connection string
```

Microsoft Patterns and Practices for Scalability To further enhance the scalability and maintainability of your polygot persistence solution embrace Microsofts recommended patterns and practices

Microservices Architecture Break down your application into smaller independent services each interacting with specific databases This promotes independent scaling and fault isolation

CQRS Command Query Responsibility Segregation Separate read and write operations optimizing for different database technologies Reads might use a NoSQL database for speed while writes stick to the SQL database for transactional integrity

Event Sourcing Capture all changes to the system as a stream of events This provides a powerful audit trail and allows for building flexible data views by replaying events

Data Partitioning/Sharding Distribute data across multiple database instances to improve scalability and reduce the load on any single server

Choosing the Right Database for the Job The selection of specific databases depends greatly on the characteristics of your application

Feature SQL Azure SQL Database NoSQL Azure Cosmos DB Data Structure Relational structured Document keyvalue graph Scalability Vertical limited horizontal High horizontal Consistency ACID Eventual Transactions Strong Limited or none Query Complexity High Lower

Summary of Key Points Polyglot persistence leverages the strengths of SQL and NoSQL databases for optimal scalability and performance Microsoft provides a comprehensive ecosystem of tools and services for implementing this 4 approach

Azure SQL Database Azure Cosmos DB Azure Redis Cache Utilizing patterns like microservices CQRS and event sourcing enhance the overall architectures scalability and maintainability Careful selection of database technologies based on data characteristics is crucial for success

FAQs

- 1 How do I handle data consistency across multiple databases Implement robust data synchronization mechanisms using message queues like Azure Service Bus or change data capture CDC to propagate updates between databases
- 2 What are the challenges of using polygot persistence Increased complexity in development and management along with the need for expertise in multiple database technologies
- 3 How do I choose the right caching strategy Consider factors like data volatility access frequency and cache size when deciding

between different caching mechanisms eg in memory caching distributed caching 4 Can I use polyglot persistence with existing applications Yes but a phased migration approach is often recommended to minimize disruption Start by identifying specific data that would benefit from a different database technology 5 What are the cost implications of using multiple databases While there are additional costs associated with managing multiple databases the benefits in scalability and performance often outweigh these costs particularly for largescale applications By carefully considering these points and leveraging the power of Microsofts technologies and best practices you can build truly scalable and resilient data access solutions for your applications Remember that the key to success lies in understanding your applications specific needs and choosing the right tools for the job

NoSQL DistilledData Access for Highly-Scalable SolutionsSmart Technologies, Systems and ApplicationsBig Data ImperativesIntelligent Information and Database SystemsHybrid Cloud Polyglot Bridging SQL & NoSQLCassandra: The Definitive GuideBuilding Modular Cloud Apps with OSGiFast and Scalable Cloud Data ManagementA Deep Dive into NoSQL Databases: The Use Cases and ApplicationsWeb Scalability for Startup EngineersFundamentals of NoSQLA Unified Query Language for Polyglot Persistence EnvironmentsBuilding MicroservicesBridging Relational and NoSQL DatabasesNoSQL For DummiesNoSQL for Mere MortalsPython Data PersistenceAdvanced Data ManagementBuilding Modern Web Applications With Jakarta EE, NoSQL Databases and Microservices Pramod J. Sadalage Douglas McMurtry Fabián R. Narváez Soumendra Mohanty Ngoc Thanh Nguyen David Tauck Jeff Carpenter Paul Bakker Felix Gessert Artur Ejsmont C. Balakrishnan Gregg James Bailey Sam Newman Gaspar, Drazena Adam Fowler Dan Sullivan Lathkar Malhar Lena Wiese Aristides Villarreal Gonzalez Bravo, Geovanny Mendoza Santana Otavio Goncalves de

NoSQL Distilled Data Access for Highly-Scalable Solutions Smart Technologies, Systems and Applications Big Data Imperatives Intelligent Information and Database Systems Hybrid Cloud Polyglot Bridging SQL & NoSQL Cassandra: The Definitive Guide Building Modular Cloud Apps with OSGi Fast and Scalable Cloud Data Management A Deep Dive into NoSQL Databases: The Use Cases and Applications Web Scalability for Startup Engineers Fundamentals of NoSQL A Unified Query Language for Polyglot Persistence Environments Building Microservices Bridging Relational and NoSQL Databases NoSQL For Dummies NoSQL for Mere Mortals Python Data Persistence Advanced Data Management Building Modern Web Applications With Jakarta EE, NoSQL Databases and Microservices *Pramod J. Sadalage Douglas McMurtry Fabián R. Narváez Soumendra Mohanty Ngoc Thanh Nguyen David Tauck Jeff Carpenter Paul Bakker Felix Gessert Artur Ejsmont C. Balakrishnan Gregg James Bailey Sam Newman Gaspar, Drazena Adam Fowler Dan Sullivan Lathkar Malhar Lena Wiese Aristides Villarreal Gonzalez Bravo, Geovanny Mendoza Santana Otavio Goncalves de*

the need to handle increasingly larger data volumes is one factor driving the adoption of a new class of nonrelational nosql databases advocates of nosql databases claim they can be used to build systems that are more performant scale better and are easier to program nosql distilled is a concise but thorough introduction to this rapidly emerging technology pramod j sadalage and martin fowler explain how nosql databases work and the ways that they may be a superior alternative to a traditional rdbms the authors provide a fast paced guide to the concepts you need to know in order to evaluate whether nosql databases are right for your needs and if so which technologies you should explore further the first part of the book concentrates on core concepts including schemaless data models aggregates new distribution models the cap theorem and map reduce in the second part the authors explore architectural and design issues associated with implementing nosql they also present realistic use cases that demonstrate nosql databases at work and feature representative examples using riak mongodb cassandra and neo4j in addition by drawing on pramod sadalage s pioneering work nosql distilled shows how to implement evolutionary design with schema migration an essential technique for applying nosql databases the book concludes by describing how nosql is ushering in a new age of polyglot persistence where multiple data storage worlds coexist and architects can choose the technology best optimized for each type of data access

all applications use data and most applications also need to store this data somewhere in the world of business solutions this often meant creating a relational database however relational technology is not always the best solution to meet the increasingly complex data processing requirements of modern business systems especially when this processing involves storing and retrieving massive amounts of data the advent of nosql databases has changed the way in which organizations have started to think about the way in which they structure their data there is no standard definition of what a nosql database is other than they are all non relational they are less generalized than relational databases but the driving force behind most nosql databases is focused efficiency and high scalability the downside of nosql is that no single database is likely to be able to support the complete range of business requirements mandated by your applications how do you select the most appropriate database to use or should you remain with the relational model a modern business application is not restricted to using a single data store and an increasing number of solutions are now based on a polyglot architecture the key to designing a successful application is to understand which databases best meet the needs of the various parts of the system and how to combine these databases into a single seamless solution this guide helps you understand these challenges and enables you to apply the principles of nosql databases and polyglot solutions in your own environment to help illustrate how to build a polyglot solution this guide presents a case study of a fictitious company faced with building a highly scalable web application capable of supporting many thousands of concurrent users

this two volume set ccis 2392 and ccis 2393 constitutes the refereed proceedings of the 4th international conference on smart technologies systems and applications smarttech ic 2024 held in quito ecuador during december 2 4 2024 the 68 full papers presented in these proceedings were carefully reviewed and selected from 168 submissions they were categorized under the following topical sections part i smart technologies smart systems part ii smart trends and applications poster session

big data imperatives focuses on resolving the key questions on everyone s mind which data matters do you have enough data volume to justify the usage how you want to process this amount of data how long do you really need to keep it active for your analysis marketing and bi applications big data is emerging from the realm of one off projects to mainstream business adoption however the real value of big data is not in the overwhelming size of it but more in its effective use big data imperatives describes the complementary nature of traditional data warehouses and big data analytics platforms and how they feed each other this book aims to bring the big data and analytics realms together with a greater focus on architectures that leverage the scale and power of big data and the ability to integrate and apply analytics principles to data which earlier was not accessible this book can also be used as a handbook for practitioners helping them on methodology technical architecture analytics techniques and best practices at the same time this book intends to hold the interest of those new to big data and analytics by giving them a deep insight into the realm of big data

the two volume set Inai 10751 and 10752 constitutes the refereed proceedings of the 10th asian conference on intelligent information and database systems aciids 2018 held in dong hoi city vietnam in march 2018 the total of 133 full papers accepted for publication in these proceedings was carefully reviewed and selected from 423 submissions they were organized in topical sections named knowledge engineering and semantic social networks and recommender systems text processing and information retrieval machine learning and data mining decision support and control systems computer vision techniques advanced data mining techniques and applications multiple model approach to machine learning sensor networks and internet of things intelligent information systems data structures modeling for knowledge representation modeling storing and querying of graph data data science and computational intelligence design thinking based r d development technique and project based learning intelligent and contextual systems intelligent systems and algorithms in information sciences intelligent applications of internet of thing and data analysis technologies intelligent systems and methods in biomedicine intelligent biomarkers of neurodegenerative processes in brain analysis of image video and motion data in life sciences computational imaging and vision computer vision and robotics intelligent computer vision systems and applications intelligent systems for optimization of logistics and industrial applications

the main objective of this study is to determine the influence of fragmenting a database between sql and nosql on the cloud many factors affect the adoption of cloud computing by the enterprises and they shall be evaluated from a system point of view prior to making the decision to adopt a cloud based solution the purpose of this study is to recognize those factors and determine the extent to which they affect the adoption of cloud computing for smes in addition studying the feasibility of establishing a hybrid database structure between relational and nosql databases to achieve an optimal solution was also covered therefore this study describes a detailed research model on implementing a hybrid database integration between sql and nosql on the cloud the need for scalable database has increased with the growing data in the web world those needs have been fulfilled by the nosql databases with its high scalability and easy programmable model the demand for nosql database is growing because most of the built cloud applications support high availability speed failover options fault tolerance and consistency which a traditional relational database fails to offer to the modern web applications thus dealing with huge data processing on the web has been cost effective by the nosql databases moreover nosql database and cloud computing goes hand in hand when compared with sql databases to apply these concepts we implemented and tested the benefits of cloud computing and nosql integrated with sql database through microsoft azure we uploaded a database on sql azure and created a tool to offload all the inactive daa in the ledger tables for years from sql azure to azure storage tables also another tool to retrieve the data from azure storage table to be available for any study or analysis

imagine what you could do if scalability wasn t a problem with this hands on guide you ll learn how the cassandra database management system handles hundreds of terabytes of data while remaining highly available across multiple data centers this third edition updated for cassandra 4 0 provides the technical details and practical examples you need to put this database to work in a production environment authors jeff carpenter and eben hewitt demonstrate the advantages of cassandra s nonrelational design with special attention to data modeling if you re a developer dba or application architect looking to solve a database scaling issue or future proof your application this guide helps you harness cassandra s speed and flexibility understand cassandra s distributed and decentralized structure use the cassandra query language cql and cqlsh the cql shell create a working data model and compare it with an equivalent relational model develop sample applications using client drivers for languages including java python and node js explore cluster topology and learn how nodes exchange data

if you re an experienced java developer in the enterprise this practical hands on book shows you how to use osgi to design develop and deploy modular cloud applications you ll quickly learn how to use osgi through concise code examples and a set of best practices derived from the authors experiences with real world projects through the course of this book you ll

learn to develop modern web applications with tools and techniques such as restful services nosql provisioning elasticity auto scaling hotfixes and automatic failover code samples are available from github work with dynamic osgi services to create modular applications explore the basics of osgi bundles and modular application design learn advanced topics including semantic versioning integration testing and configuring components understand osgi pitfalls anti patterns and features you should avoid create a modular architecture for cloud based web applications discover how maintainability extensibility scalability and testability are affected by modular design get a look at various options for creating web applications with a modular approach interact with persistent storage services including relational databases and nosql examine alternatives for deploying modular applications to the cloud

the unprecedented scale at which data is both produced and consumed today has generated a large demand for scalable data management solutions facilitating fast access from all over the world as one consequence a plethora of non relational distributed nosql database systems have risen in recent years and today s data management system landscape has thus become somewhat hard to overlook as another consequence complex polyglot designs and elaborate schemes for data distribution and delivery have become the norm for building applications that connect users and organizations across the globe but choosing the right combination of systems for a given use case has become increasingly difficult as well to help practitioners stay on top of that challenge this book presents a comprehensive overview and classification of the current system landscape in cloud data management as well as a survey of the state of the art approaches for efficient data distribution and delivery to end user devices the topics covered thus range from nosql storage systems and polyglot architectures backend over distributed transactions and caching network to data access and rendering performance in the client end user by distinguishing popular data management systems by data model consistency guarantees and other dimensions of interest this book provides an abstract framework for reasoning about the overall design space and the individual positions claimed by each of the systems therein building on this classification this book further presents an application driven decision guidance tool that breaks the process of choosing a set of viable system candidates for a given application scenario down into a straightforward decision tree

a deep dive into nosql databases the use cases and applications volume 109 the latest release in the advances in computers series first published in 1960 presents detailed coverage of innovations in computer hardware software theory design and applications in addition it provides contributors with a medium in which they can explore their subjects in greater depth and breadth this update includes sections on nosql and newsql databases for big data analytics and distributed computing newsql databases and scalable in memory analytics nosql web crawler application nosql security a comparative study of different in

memory no new sql databases nosql hands on 4 nosqls the hadoop ecosystem and more provides a very comprehensive yet compact book on the popular domain of nosql databases for it professionals practitioners and professors articulates and accentuates big data analytics and how it gets simplified and streamlined by nosql database systems sets a stimulating foundation with all the relevant details for nosql database researchers developers and administrators

this invaluable roadmap for startup engineers reveals how to successfully handle web application scalability challenges to meet increasing product and traffic demands scalability for startup engineers shows engineers working at startups and small companies how to plan and implement a comprehensive scalability strategy it presents broad and holistic view of infrastructure and architecture of a scalable web application successful startups often face the challenge of scalability and the core concepts driving a scalable architecture are language and platform agnostic the book covers scalability of http based systems websites rest apis saas and mobile application backends starting with a high level perspective before taking a deep dive into common challenges and issues this approach builds a holistic view of the problem helping you see the big picture and then introduces different technologies and best practices for solving the problem at hand the book is enriched with the author s real world experience and expert advice saving you precious time and effort by learning from others mistakes and successes language agnostic approach addresses universally challenging concepts in development scalability does not require knowledge of a particular language fills the gap for engineers in startups and smaller companies who have limited means for getting to the next level in terms of accomplishing scalability strategies presented help to decrease time to market and increase the efficiency of web applications

the era of polyglot persistence has begun the emergence of nosql databases alarms the end of the dominance of relational databases nosql not only sql surly not to replace relational databases rather it gives more convenience to the developers to have database design with elastic nature for their projects relational data models will still be popular however will no longer be the automatic choice to take advantage of this paradigm change one need to be familiar with the underlying concepts of nosql to become data professionals because data professionals should be familiar with these different approaches to know how to match them for their solutions nosql introduces the new ways of data modeling data consistency and data evolution this book surly helps the developers to learn and cherish the power of nosql in building their representative systems using this new technique this book gives an introductory to the underlying concepts of nosql such as implementation of cap theorem in various nosql databases different data storage techniques along with the brief outline of two major document store nosql databases such as mongodb and couchdb

in 1970 e f codd released his monumental paper on the relational model that sparked a



movement that lasted for over forty years codd's relational model has been the workhorse database model for persisting data in almost every aspect of technology from ecommerce to scientific data not only has the model proved to be the best choice for most application development that relies on data stores but structured query language sql has provided a declarative complete and feature rich language for accessing data from the relational model the lasting power of the relational model is a true testament to its design but new trends are beginning to strain its capabilities the emergence of big data more powerful hardware the growing use of micro services and the improved design of alternate persistence paradigms have shifted some of the market away from relational databases these database systems are collectively known as nosql while no one particular nosql option will replace the relational model each one carries a rich set of features that make it suitable for certain types of data and relationships potentially architects can now decide which persistence model they would like to use for specific subsets of their data while powerful and convenient this does carry the overhead of having to learn the intricacies of each model and the various query languages that each carries with it this alone can inhibit the adoption of polyglot persistence in many scenarios in other words does the benefit of targeted database models outweigh the difficulty and time needed by developers to be comfortable with each model i propose a unified querying language based on a key value structure that would completely abstract away the underlying persistence model and allow the developer to focus more on application development and thus be more productive in this paper i present a system for accessing data from an application that utilized polyglot persistence without the need for the developer to have any knowledge pertaining to the underlying querying languages used by each database

as organizations shift from monolithic applications to smaller self contained microservices distributed systems have become more fine grained but developing these new systems brings its own host of problems this expanded second edition takes a holistic view of topics that you need to consider when building managing and scaling microservices architectures through clear examples and practical advice author sam newman gives everyone from architects and developers to testers and it operators a firm grounding in the concepts you'll dive into the latest solutions for modeling integrating testing deploying and monitoring your own autonomous services real world cases reveal how organizations today manage to get the most out of these architectures microservices technologies continue to move quickly this book brings you up to speed get new information on user interfaces container orchestration and serverless align system design with your organization's goals explore options for integrating a service with your system understand how to independently deploy microservices examine the complexities of testing and monitoring distributed services manage security with expanded content around user to service and service to service models

relational databases have been predominant for many years and are used throughout various

industries the current system faces challenges related to size and variety of data thus the nosql databases emerged by joining these two database models there is room for crucial developments in the field of computer science bridging relational and nosql databases is an innovative source of academic content on the convergence process between databases and describes key features of the next database generation featuring coverage on a wide variety of topics and perspectives such as base approach cap theorem and hybrid and native solutions this publication is ideally designed for professionals and researchers interested in the features and collaboration of relational and nosql databases

get up to speed on the nuances of nosql databases and what they mean for your organization this easy to read guide to nosql databases provides the type of no nonsense overview and analysis that you need to learn including what nosql is and which database is right for you featuring specific evaluation criteria for nosql databases along with a look into the pros and cons of the most popular options nosql for dummies provides the fastest and easiest way to dive into the details of this incredible technology you ll gain an understanding of how to use nosql databases for mission critical enterprise architectures and projects and real world examples reinforce the primary points to create an action oriented resource for it pros if you re planning a big data project or platform you probably already know you need to select a nosql database to complete your architecture but with options flooding the market and updates and add ons coming at a rapid pace determining what you require now and in the future can be a tall task this is where nosql for dummies comes in learn the basic tenets of nosql databases and why they have come to the forefront as data has outpaced the capabilities of relational databases discover major players among nosql databases including cassandra mongodb marklogic neo4j and others get an in depth look at the benefits and disadvantages of the wide variety of nosql database options explore the needs of your organization as they relate to the capabilities of specific nosql databases big data and hadoop get all the attention but when it comes down to it nosql databases are the engines that power many big data analytics initiatives with nosql for dummies you ll go beyond relational databases to ramp up your enterprise s data architecture in no time

the easy common sense guide to solving real problems with nosql the mere mortals tutorials have earned worldwide praise as the clearest simplest way to master essential database technologies now there s one for today s exciting new nosql databases nosql for mere mortals guides you through solving real problems with nosql and achieving unprecedented scalability cost efficiency flexibility and availability drawing on 20 years of cutting edge database experience dan sullivan explains the advantages use cases and terminology associated with all four main categories of nosql databases key value document column family and graph databases for each he introduces pragmatic best practices for building high value applications through step by step examples you ll discover how to choose the right

database for each task and use it the right way coverage includes getting started what nosql databases are how they differ from relational databases when to use them and when not to data management principles and design criteria essential knowledge for creating any database solution nosql or relational key value databases gaining more utility from data structures document databases schemaless databases normalization and denormalization mutable documents indexing and design patterns column family databases google s bigtable design table design indexing partitioning and big data graph databases graph network modeling design tips query methods and traps to avoid whether you re a database developer data modeler database user or student learning nosql can open up immense new opportunities as thousands of database professionals already know for mere mortals is the fastest easiest route to mastery

designed to provide an insight into the sql and mysql database concepts using python key features a practical approach ample code examples a quick start guide to python for beginners description python is becoming increasingly popular among data scientists however analysis and visualization tools need to interact with the data stored in various formats such as relational and nosql databases this book aims to make the reader proficient in interacting with databases such as mysql sqlite mongodb and cassandra this book assumes that the reader has no prior knowledge of programming hence basic programming concepts key concepts of oop serialization and data persistence have been explained in such a way that it is easy to understand nosql is an emerging technology using mongodb and cassandra the two widely used nosql databases are explained in detail the knowhow of handling databases using python will certainly be helpful for readers pursuing a career in data science what will you learn python basics and programming fundamentals serialization libraries pickle csv json and xml db ap and sqlalchemy python with excel documents python with mongodb and cassandra who this book is for students and professionals who want to become proficient at database tools for a successful career in data science table of contents1 getting started2 program flow control3 structured python4 python oop5 file io6 object serialization7 rdbms concepts8 python db api9 python sqlalchemy10 python and excel11 python pymongo12 python cassandraappendix a alternate python implementationsappendix b alternate python distributionsappendix c built in functionsappendix d built in modulesappendix e magic methodsappendix f sqlite dot commandsappendix g ansi sql statementsappendix h pymongo api methodsappendix i cassandra cql shell commands about the author malhar lathkar is an independent software professional programming technologies trainer e learning subject matter expert he is a of director institute of programming language studies having an academic experience of 33 years his expertise is in java python c iot php databases his linkedin linkedin com in malharlathkar his blog indsport.blogspot.com

advanced data management has always been at the core of efficient database and information systems recent trends like big data and cloud computing have aggravated the need for sophisticated and flexible data storage and processing solutions this book provides a comprehensive coverage of the principles of data management developed in the last decades with a focus on data structures and query languages it treats a wealth of different data models and surveys the foundations of structuring processing storing and querying data according these models starting off with the topic of database design it further discusses weaknesses of the relational data model and then proceeds to convey the basics of graph data tree structured xml data key value pairs and nested semi structured json data columnar and record oriented data as well as object oriented data the final chapters round the book off with an analysis of fragmentation replication and consistency strategies for data management in distributed databases as well as recommendations for handling polyglot persistence in multi model databases and multi database architectures while primarily geared towards students of master level courses in computer science and related areas this book may also be of benefit to practitioners looking for a reference book on data modeling and query processing it provides both theoretical depth and a concise treatment of open source technologies currently on the market

build modern apps with jakartaee jmoordb and vaadinskey featuresa learn about the java enterprise edition jakarta enterprise edition specifications a learn how to create applications with frameworks such as java server faces eclipse krazo and vaadin a get familiar with nosql databases and learn how to create java applications that interact using jakarta nosql and jmoordb a learn how to test and secure your application a learn about microprofile and how to create microservices with java descriptionfor many years java ee has been an important platform for mission critical enterprise applications to accelerate the development of enterprise applications for a cloud native world leading software vendors collaborated to transfer java ee technologies to the eclipse foundation where they will evolve under the jakarta ee brand this book will be your comprehensive guide to creating jakarta ee applications and microservices with microprofile the book begins with an introduction to jakarta ee and quickly goes on to teach you about the various databases and their advantages after this you will explore the jnosql and jmoordb frameworks to understand how to build jakarta ee applications with nosql databases moving forward you ll explore eclipse microprofile and see how it helps build microservices with java also you will learn about various development applications such as java server faces eclipse krazos primefaces vaadin and understand how to integrate them with your backend towards the end you will learn about security testing and understanding continuous integration what will you learna learn how to use the jmoordb framework for jakarta ee applications a optimize enterprise java for microservices architecture using eclipse microprofile a create applications using java server faces a building a modern web application using vaadin a learn how to implement

security using identitystore and jwt a create ci cd pipelines for jakarta ee applications who this book is forthis book is for developers with no previous experience in creating business applications with java and for those who want to know about apis and new frameworks for the development of cloud oriented applications table of contents1 jakarta ee platform2 nosql3 jakarta nosql4 understanding jmoordb5 exploring microprofile6 java server faces7 vaadin8 integration vaadin jmoordb and nosql9 eclipse krazos and security of microservices10 testing and continuous integrationabout the authorsaristides villarreal bravo lives in panama is a java developer member of netbeans dream teams since 2007 jug leaders he is currently working on developing java applications and with greater emphasis on technologies such as java enterprise edition jakarta ee microprofile and nosql databases he has developed several plugins for apache netbeans ide and is working on his jmoordb project a java api for nosql your linkedin profile linkedin com in aristides villarreal bravo 6258543 geovanny mendoza gonzalez is a senior backend developer in java lives in colombia b s in system engineering from the simon bolivar university of colombia with a specialization in software engineering from the north university of barranquilla colombia certified on vaadin 14 framework professional and developer your linkedin profile linkedin com in gmendozag otavio goncalves de santana is a passionate software engineer focused on java technology he has experience mainly in persistence polyglot and high performance applications in finances social media and e commerce otavio is a member of both expert groups and expert leader in several jsrs and jcp executive committee your linkedin profile linkedin com in otaviojava

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