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Updated 05/06/2024

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Dapr Training: .NET Microservice

3 days (21 hours)

Presentation

Dapr (Distributed application Runtime) is a new open source project that provides techniques and best practices for developing modern applications. With Dapr you can create resilient, secure microservices for service invocations and pub/sub messaging. Dapr's APIs simplify microservices connectivity. Dapr handles complex challenges such as message broker integration, observability or service discovery, allowing you to focus on business logic while keeping your code simple. Our Dapr training: Microservices .NET will introduce you to how Dapr works, microservices architecture, building microservices with Dapr, application tracing and deployment to Kubernetes. You'll understand how Dapr's runtime, services, building blocks and software development kits (SDKs) help you simplify the creation of resilient, reliable microservices. We'll teach you the latest version of the program: Dapr v1.6.

Objectives

- Mastering microservices architecture
- Creating microservices with Dapr
- Writing a high-performance distributed application
- Creating microservice applications in open building blocks
- Discover how Dapr works with Kubernetes

Target audience

- Web and Application Developers
- Architect
- Digital project manager

Prerequisites

- Knowledge of .NET
- Knowledge of Kubernetes

Dapr training program: Microservice .NET

Introduction to Dapr

- Introducing Dapr
- Technical requirements
- Configuration
- Architecture
- Dapr CLI
- Dapr installation in stand-alone mode
- Update

Debugging Dapr solutions

- Dapr VS Code debugging configuration
- Attaching the debugger
- Debugger configuration review
- Debugging a multi-project solution
- Creating .NET solutions

Start configuration

- Launch individual debugging sessions
- Launching compound debugging sessions
- Using Tye with Dapr
- Tye installation
- Using Tye

Microservices with Dapr

- Building microservices with Dapr
  - Loosely coupled microservices
  - Stand-alone microservices
  - Observable microservices
  - Scalable microservices
  - Event-driven microservices
  - Stateless microservices
- Service-to-service invocation
- How Dapr services work

- Service invocation with the .NET SDK
- Creating a project for the Order department

Microservice architecture with Dapr

- Automated deployment
- Delimited context
- Loose coupling
- Event-driven architecture
- Observability
- Durability
- Adopt microservices models
- Building an e-commerce architecture
- Delimited contexts

Configuring Dapr in ASP.NET

- Implementing Dapr with an ASP.NET controller
- Creating a project for the reservations service
- Preparing the debugging configuration
- Implementing Dapr with ASP.NET routing
- Summary
- HTTP and gRPC for Dapr services
- gRPC in ASP.NET
- Autonomy of a microservice

Dapr status management

- State stores in Dapr
- Transactions
- Coherence
- Interaction with state stores
- State services in an online ordering system
- Reservation service with status
- Dapr status management in ASP.NET controllers
- Azure Cosmos DB as a report store
- Configuring Azure Cosmos DB
- Report store configuration
- Packaging

Publication and subscription in Dapr

- Using the pub/sub model in Dapr
- Using Azure Service Bus in Dapr

- Subscribe to a topic
- Setting up a pub/sub component
- Subject publication
- Message inspection
- Implementing a saga model
- Posting messages to Dapr
- Subscribe to a Dapr topic
- Test the saga model

Dapr link

- Learn to use Dapr links
- Setting up a cron input link
- Testing the cron link
- Using Twilio output links in Dapr
  - Sign up for a Twilio trial
  - Configuring a Twilio output link
- Data engineering in C# with the Azure Event Hubs input link
  - Creating an Azure Event Hubs link
  - Input link configuration
  - Implementing an Azure Event Hubs inbound link
- Event production

Dapr to Kubernetes deployment

- Configuring Kubernetes
- Creating an Azure resource group
- Creating an AKS cluster
- Connecting to the AKS cluster
- Configuring Dapr on Kubernetes
- Deploying a Dapr application on Kubernetes
- Creating Docker images
- Secret management in Kubernetes
- Exposing Dapr applications to external customers

Tracing Dapr applications

- Observing applications in Dapr
- Tracing with Zipkin
- Configure Zipkin
- Setting up tracking with Zipkin
- Enable tracking in Dapr
- Analyze metrics with Prometheus and Grafana
- Import dashboards

Load testing and scaling

- Bash
- Python
- Locust
- Scaling Dapr on Kubernetes
  - Replicas
  - Autoscale
- Resource requests and limits
- Load testing with Locust
- Dapr load test
- Data preparation by port-forwarding
- Locust local test
- Locust on Azure container instances
- Autoscaler Horizontal Pod configuration
- Autoscaling with KEDA

Companies concerned

This course is aimed at both individuals and companies, large or small, wishing to train their teams in a new advanced computer technology, or to acquire specific business knowledge or modern methods.

Positioning on entry to training

Positioning at the start of training complies with Qualiopi quality criteria. As soon as registration is finalized, the learner receives a self-assessment questionnaire which enables us to assess his or her estimated level of proficiency in different types of technology, as well as his or her expectations and personal objectives for the training to come, within the limits imposed by the selected format. This questionnaire also enables us to anticipate any connection or security difficulties within the company (intra-company or virtual classroom) which could be problematic for the follow-up and smooth running of the training session.

Teaching methods

Practical course: 60% Practical, 40% Theory. Training material distributed in digital format to all participants.

Organization

The course alternates theoretical input from the trainer, supported by examples, with brainstorming sessions and group work.

Validation

At the end of the session, a multiple-choice questionnaire verifies the correct acquisition of skills.

Sanction

A certificate will be issued to each trainee who completes the course.

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