ENABLING MICROSERVICE ARCHITECTURES WITH SCALA

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Gilt Groupe
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7 For All Mankind

The denim mainstay’s hottest seasonal styles, from classic skinnies to bright cut-offs and more

Shop this Sale
IN THE BEGINNING
ONE (REALLY) BIG RAILS APP

- ~1000 models and controllers
- ~200k lines of Ruby
- ~50k lines of PostgreSQL stored procedures
PROBLEMS WITH MONOLITHIC DESIGN

- Unclear Ownership
- Complex Dependencies
- Lengthy Test Cycles
- Unexpected Performance Impacts
TRANSITION TO MICROSERVICES
PRACTICES ENABLING MICROSERVICES
GILT-SBT-BUILD

• One big SBT plugin pulling in all other plugins
• Lots of custom behavior and standard configuration
• Super simple config for individual services
gilt.GiltProject.jarSettings

name := "lib-jenkins"

libraryDependencies +++= Seq(
  "net.databinder" %% "dispatch-core" % "0.8.8",
  "net.databinder" %% "dispatch-http" % "0.8.8"
)
object Build extends ClientServerCoreProject {
  val name = "svc-persistent-session"

  val coreDeps = ... 
  val serverDeps = ... 
  val clientDeps = ... 
}

PLUGIN PROVIDES

• Nexus config
• Testing & Coverage Libraries
• RPMs
• Standard Run Scripts
• NewRelic Support
• Release Emails

• SemVer Analysis
• Dependency Heuristics
• Integration Builds
• Continuous Delivery hooks
• Auto-Upgrading
• ... and more....
CONFIGURATION
SHARED TYPE-SAFE CONFIG

- Common configuration in Zookeeper
- Override with local files or system properties
- Mapped into strongly-typed classes
- JSR-303 (Hibernate) Validation
case class MetricsConfiguration(
  @(NotEmpty @field) graphiteHost: String,
  @(Range(min=1024,max=65535) @field)
  graphitePort: Int
)
CHALLENGES OF TESTING MICRO-SERVICES

- Functional tests are extremely valuable but difficult or impractical to set up
- Unit tests are easy to run, but require complicated mocking and are fragile and unreliable
SOLUTION

A testing framework which lets one test be both a unit test and a functional test
CAKE PATTERN

- A pattern for dependency injection and more
- Enables type-safe and scalable composition
- Uses Scala’s self-types and multiple trait inheritance
trait ConfigurableClientFactory {
  self: Configuration =>

  lazy val instance: Client = ...}

object ClientFactory
  extends ConfigurableClientFactory
  with GiltConfiguration
trait TestClients {
  lazy val testClient: Client =
    (new ConfigurableClientFactory
      with TestingConfiguration).instance
}
abstract class ClientTest extends TestNGSuite with TestClients
{
    // Add your tests here
}

@Functional
class FunctionalClientTest
    extends ClientTest with FunctionalTest

@Capture
class CaptureClientTest
    extends ClientTest with CaptureTest

@Mock
class MockClientTest
    extends ClientTest with MockTest
• SBT configurations filter based on annotations

• `sbt functional:test`
  • Runs normally against services

• `sbt capture:test`
  • Like functional but records the results in files

• `sbt test:test`
UI TESTING
• sbt selenium:test

• Built on ScalaTest Selenium DSL

• Automated browser testing with reusable components

• Makes heavy use of the Scala type system
@Selenium
class Example extends FlatSpecTestBase
with Matchers with ConfigurableBrowser
with LoggedInTestUser
with OnProductDetailPage
with AvailableToPurchaseItem
with InMens
with CloseBrowserAfterAllTests {

  "A size chart" should "be available" in {
    // test goes here
  }
}
trait LoggedInTestUser extends BeforeAndAfterAll {
    self: Suite with WebBrowser =>

    override protected def beforeEach() {
        super.beforeAll()
        delete all cookies

        login(user, pass).foreach(msg => fail(msg))
    }
}
@Selenium
class Example extends FlatSpecTestBase
with Matchers with ConfigurableBrowser
with LoggedInTestUser
with OnProductDetailPage
with AvailableToPurchaseItem
with InMens
with CloseBrowserAfterAllTests {

  "A size chart" should "be available" in {
    // test goes here
  }
}
CONTINUOUS DELIVERY
IONCANNON

• Fully automated testing & deployment

• `sbt release` triggers deployment to a staging environment mirroring production

• Automated tests run

• Promote to production or rollback
## Summary of Latest IonCannon Activities

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<tr>
<th>Name</th>
<th>Version</th>
<th>State</th>
<th>Targets</th>
<th>Released By</th>
<th>Released At</th>
<th>Deployed At</th>
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<td>Wed Sep 18 2013 09:02:43 PDT</td>
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THE FUN STUFF
Andrea Pompilio ★
Corduroy Blazer
$399 Gilt
$560

John Varvatos Collection ★
Relax Fit Pants
$199 Gilt
$498

John Varvatos ★
Linen Crewneck Tee
$49 Gilt
$158
LIVE INVENTORY UPDATES

- Creates excitement and urgency for shoppers
- Simple event-driven Play application
- Uses websockets and Akka actors
FREEFALL SALES

• Essentially a Dutch auction

• Similar Web Sockets & Actors implementation
Gilt Freefall: The Wow Moment

First Chance
Starts at 3:00 PM

Second Chance
Starts at 3:05 PM

Third Chance
Starts at 3:10 PM

Last Chance
Starts at 3:15 PM

First Chance starts in 8 seconds

Hermès
Mykonos Swift Birkin 30cm

Versace Collection
Flecked Suit

Cassina
LC4 ‘Blonde’ Chaise

Mercedes-Benz
G Class

Ring
Diamond and Sapphire Ring
THANK YOU

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