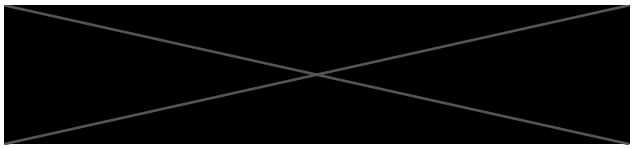
Francesco Russo



INTERESTS

Distributed Systems, NoSQL, Data-Lake, Big Data, Operational Excellence, Communication & Presentations, Complex Adaptive Systems, Applied Security, Mentoring, Career Growth.

EDUCATION

2002: Laurea in Computer Science, 105 (/110) University of Bologna, Italy.
Thesis Title: Design and Implementation of a Framework for Agent-based Peer-to-Peer Systems.
Thesis Field: Complex Adaptive Systems.
Available on line at the following URL: http://www.cs.unibo.it/projects/anthill/papers/thesis-russo.pdf

2009: TOEFL IBT Certification with the score of 107/120 (29, 27, 22, 29/30). A printed copy can be sent by fax if required

PATENTS

2015: "System and methods identifying and reacting to potentially malicious activity" - Russo et al. - US 09154515 (http://pdfpiw.uspto.gov/.piw?Docid=09154515)

EXPERIENCE (MOST RECENT TO OLDEST)

DISCOVER APP (London, 2018 - current)

As a personal fun & side-project that blends my passion for music and technology I have built and I keep on working on DiscOver, a social musical app for iOS. I own the app end to end, from the native iOS client to the Google Cloud based back-end APIs and services. Working on DiscOver is a way for me to explore product-management, mobile development, a cloud provider which complements my already deep AWS expertise, and to have and use the application I wanted and nobody built before :).

AMAZON PRIME VIDEO (London, 2016 - current)

Senior SDE (SDE 3)

- Providing technical leadership and guidance to a population of 50+ engineers via: mentorship, dedicated 1:1 focused on career and growth, technical talks (both streamed live across all Amazon locations or local), technical design reviews, services operational reviews, code reviews.
- Prime Video Builder Tools Automated Reasoning's BugBear. Leading a team of 11 in the design, delivery, growth and execution of BugBear, a platform for providing customers with insightful automated and machine-generated comments to their code-bases. Comments are post by bots to code-review tools (BitBucket i.e.). BugBear can run multiple static analysis tools (Infer i.e.) and is extensible in terms input events, analyzers, code-repositories, output

events, code-review tools. BugBear is targeted at the whole Amazon engineering community. The solution leverages: API Gateway, Lambda, Fargate, Batch, SQS, SNS, Dynamo, Cassandra, etc.

- Prime Video Builder Tools Firewood, English Premier League readiness. Led a team of 3 in improving the operational posture of Firewood, a log collection and analysis service that receives logs and events from both Prime Video living room clients across the globe and Prime Video services. The main goal was ensuring a smooth experience during the high-peak events of the English Premier League. Firewood behaviour was spotless in each ELP game. The solution is based on Kinesis, Firehose, S3, LogStash, ElasticSearch.

- Prime Video Partner Engineering Data-Lake. Delivered a data-lake solution for helping my organisation in collecting and surfacing metrics required for decision making. I delivered the product by initially building a PoC covering a reduced data-set, built consensus across the leadership of Partner Engineering, got assigned a team of 5 engineers, led the team through implementation and delivery. The data-lake is now serving both queryable data and visual dashboards to every team in Partner Engineering. The solution runs on AWS and leverages: Dynamo, Aurora, Glue (PySpark), S3, Athena (Presto), QuickSight.

- Unified Logs Collection. Delivered a unified logs collection system to allow for a reduced TTR in case of customer issues. This service is now enabling teams in Prime Video Living Room when troubleshooting their services. AWS tech-stack: CloudWatch Logs agent, CloudWatch, Lambda, ElasticSearch, Kibana.

- RESTCanary. As a 20% time personal project, delivered a service for creating and running canaries in native AWS. Success stories: canaries are created in a matter of minutes with no coding required; RESTCanary is now applied by multiple teams in Prime Video Living Room to continuously verify live services and are the cornerstone for operational excellence; engineers across Prime Video Living Room keep adding features to the core product as they need. I'm currently the maintainer of the package.

- Partner Central. Designed, delivered and operated Partner Central, Prime Video primary interface to third-party device manufacturers to guide them through the process of porting the Prime Video living room client onto their devices. This was achieved leading a team of 8 engineers. Partner Central is a micro-services based platform with a central coordinator surrounded by domain-specific micro-services. Key success stories: increased process transparency for device manufacturers, improved delivery times via self-service, ease of extensibility. Partner Central runs on AWS leveraging: Lambda, Aurora, Dynamo, S3, CloudFront, CloudWatch, ElasticSearch.

B B C (London, 2014 - 2016)

Principal Software Engineer

- Influenced and changed the department's interview process by proposing a new interview step focused on probing a candidate's ability to devise a sound architecture for solving a real-life problem. The focus of this new interview step is to identify: attention to scalability, knowledge on how distributed systems behave and fail, understanding of what the operational burden of a system is and how to mitigate it, experience with capacity-planning etc. Despite initial resistances now both line-managers and senior engineers are in favour of this new challenge and the brightest candidates enjoy being put through a step that allows them to demonstrate their full skill-set. This also allows the Future Media Department to raise the quality of its engineering team.

- Designed and delivered Logarama, a new internal system aimed at continuously crunching CDN unstructured logs so to provide our media-distribution partners with a fresh and detailed understanding of how content is delivered to BBC's audience. Logarama has been build with strong properties in mind: idempotency, self-healing (for a portion

of its failure-scenarios), horizontal scalability, stream-processing. Logarama is a full replacement of a previous internal system. Logarama leverages: EC2, Dynamo, S3, Lambda, Aurora

- Designed and delivered Sawmill, our new soft-realtime alerting system aimed at informing BBC's internal 24/7 team when potential on-line streaming service disruptions occur. The system operates under the following SLA: 1' latency, ~15K tps. Sawmill is horizontally scalable, which means it can cope with further load if necessary with no impact of the latency. A non-functional major achievement has been cost containment. The solution in based on AWS and leverages Kinesis, Lambda, S3, CloudWatch.

- Joined BBC's analytics team. Initially focused on improving the availability of our internal ElasticSearch-based logs ingestion system. I consider this as my first great achievement within this team for after three weeks of root cause analysis, 5Ys sessions and code-changes the system has not experienced a single outage anymore. Team-wise, gained trust and time to focus new important products.

- Focus on rebuilding BBC's internal CI system leveraging a series on AWS products, with a team of 7 engineers at diverse experience levels. Main values brought into the team: attention to security, scalability and fault-tolerance

A M A Z O N (Dublin, 2012 - 2014)

Software Development Engineer Security Intelligence

• Performance Review results: (Performance Rating: Exceeds; Leadership Principles Rating: Solid Strength)

• Managing and technically leading Amazon's Dublin-based Security Intelligence team. Focused on the development of a novel internal system, I have personally created and owned since its inception, for continuous event-streams analysis. This system faces all the typical Amazon scalability and throughput challenges. As a person, I have developed a new attention and sensibility for security-issues and practices to always keep a good security posture in the systems I work with, either as a user or as an engineer.

• I represent my team in our Department's Leadership Team, a distributed team of contributors in charge of driving the whole department's efforts.

• Experience with Curator, Zookeeper, AWS SQS, AWS DynamoDB, AWS ElastiCache, Splunk and a huge number of Amazon's internal technologies. Exposure to Ruby and Ruby On Rails.

• Developed a good passion for the Scala language.

N E W B A Y (Dublin, 2010 - 2012)

Senior Software Engineer

Experience with Spring, Scrum, distributed storage-system design & implementation, REST, scalable systems, multimedia-files processing.

• Added federation to our internal non-SQL distributed storage, allowing it to scale to multiple PetaBytes without incurring in the overhead of reshuffling data amongst the nodes in the cluster.

• Introduced strong encryption for objects stored in our internal non-SQL distributed storage, based on AES-256. The encryption of objects happens on the fly, while clients stream data into the storage. Encrypted objects can be read in client-defined chunks out from the storage, and only the actually required chunk is deciphered.

• Entirely designed from scratch a zero-downtime meta-data migration procedure for the non-SQL system mentioned before (migration to Cassandra). The procedure is journal-less, and can be performed without blockages.

• Joined the team dedicated to our multi-terabyte non-SQL storage solution inspired by Amazon's Dynamo (decentralized, based on consistent-hashing, implements de-duplication of objects being stored and allows storing metadata along with the real objects)

• Worked as a team-leader on a new project aimed at creating a distributed infrastructure for logging and event-reporting with high-performance and high-scalability requirements. Implementation based on Scribe and Thrift

• Worked on the design and implementation of different features of a cloud-based digital-life solution used by major world-wide mobile-carriers subscribers to transparently keep in sync their data despite of their originating location (mobile-devices, laptops, workstations)

CINECA (Bologna 2004 - 2009)

Senior JEE Architect

• In collaboration with Prof. Alberto Montresor (University of Trento) and coordinated by Prof. Ozalp Babaoglu (University of Bologna) started working on the definition of a new application-level protocol for P2P streaming of audio-video content. In conjunction with this activity two new open-source projects I currently own were started:

1. Pastry for PeerSim (http://code.google.com/p/peersim-pastry/): a Pastry (http://research.microsoft.com/en-us/um/people/antr/PASTRY/) implementation for the PeerSim simulator (http://peersim.sourceforge.net)

2. *-Stream (Star Stream) (http://code.google.com/p/star-stream/): a PeerSim-based implementation of the conceived protocol

• Given a Lightning Talk at FOSDEM 2009 (http://fosdem.org http://fosdem.org/2009/schedule/events/jtrunner) about the new upcoming release of one of my open source project, Java Test Runner (http://jtrunner.sourceforge.net). The slides created and used for the presentation can be downloaded from http://jtrunner.sourceforge.net/JTR/Presentations.html

• Good experience with Google App Engine for Java & GWT

• Developed multiple JMX components and integrated them into Oracle Application Server and OC4J

• Attended Sun's "Object-Oriented Analysis and Design Using UML" (OO-226) course

• Working on a new JEE web-based application I'm having the chance to gain experience with the following set of tools and APIs: JBoss 5.0.0, EJB 3, JPA (Jakarta OpenJPA), MySQL 5 and GWT

• Good experience with BeanShell, marginal with Groovy

• Worked with an eight-person team over the design and implementation of an configurable JEE-based, SOA-inspired ERP-like system. Gained experience with workflow systems and scripting engines

• Deepened my personal knowledge of BEA's JDO 2 implementation (aka Kodo JDO), developing a set of specific extensions aimed at altering its default behavior in order to solve very specific problems not addressed by the specification (i.e. filtering over the set of details of a typical master-detail relation in JDOQL based query having as target class the master's persistence-capable class)

• Gained good experience in Java ™ bytecode manipulation: working over the JEF Project I have had the chance to learn how to “extract” methods from Java ™ classes for injecting them into other compiled classes. This is all accomplished without using any other software that enables Java ™ bytecode manipulation. Features like this can be profitably used to exploit the full power of AOP (Aspect Oriented Programming)

• Worked on the development of an internal framework meant for both designing and running finite state machines that model document-based workflows in the systems we are working on

• Worked frequently on performance-optimization issues and consequently gained good experience with Java standard troubleshooting & diagnostic tools like JConsole, jmap, jstack, HAT and so on

• Implemented an RMI-based networked Java class-loader while working on the JTR Project mentioned above

• Little experience playing around with GoogleMaps JavaScript API and Google Web Toolkit API

• Worked in the Application Integration field. Acquired good experience in designing systems based on the concept of Service Oriented Architecture. Took part at both conferences and seminars about integration challenges and the concept of the Enterprise Service Bus. Worked as advisor for one of the biggest italian organizations all along a software selection process aimed at identifying the most suitable integration solution for their needs. All the major integration players took part at the software selection: Oracle, IBM, WebMethods, Sonic

• In april 2005 I attended a five days training course concerning the Sonic Enterprise Service Bus version 6.1 in Slough, London. Once back in Italy I started studying both web services and UDDI registries. This preliminary study activity gave birth to a client side framework for a WSDL based invocation of webservices, using the Dynamic Invocation Interface (DDI) approach

• Explored both Oracle BPEL and JBoss JBPM. Worked with D-Rules for easily customizing components' processing logic

• Gained experience with two major caching frameworks: JBoss Cache and OSCache. Designed and developed a caching engine abstraction framework

• In the late 2005 started working with an eight-person team over the definition of a documental workflow system based on concepts like SOA, integration and rule based processing

• Held two internal courses covering the JEE framework sub-projects I am responsible of. Both these courses were aimed at teaching two groups of newly hired developers in the use of the framework

• Started working in the R&D department of the largest italian computing centre for defining the technical foundations of a new strategic project. Responsible for the design and development of a JEE compliant and open-standards based server-side framework for data-access and manipulation. Gained excellent knowledge and expertise in Object-to-Relational mapping tool and strategies, especially with the JDO 1.x and 2.0 specifications

• Designed and implemented, along with a team of five people, a JEE framework meant for building JEE transactional web applications

• Took part at the 2004 Java One Conference held in San Francisco

NCH (Bologna, 2002 - 2003)

Software Analyst & Developer

• Gained experience in maintaining customer relationships and in coordinating different people for rapidly solving critical problems. Assisted different customers both in loco and remotely (Monte dei Paschi di Siene, Banca Intesa)

• Worked as server-side developer acquiring great experience with SWIFT FileAct 4.4.10 service, SAG (SWIFT Alliance Gateway) configuration, and IBM MQSeries (JMS). Joined the EBA (Euro Banking Association) Step 2 Project for creating an euro inter-bank payment infrastructure, developing a SWIFT FileAct 4.4.10 compliant network driver. Ref. (http://www.abe.org)

- Hacked the Jakarta OJB (Object to Java Bridge) project in order to enable it to face temporarily database connection failures by "caching" the set of activities that should be performed, and trying to replay the same sequence of steps for a limited number of times before giving up. Good experience with XML processing

KION (Bologna, 2002 - 2003)

Software Developer

• Worked as software developer in the web area. Gained experience with Tomcat servlet container, the Jakarta Struts framework for implementing web applications based on the MVC (ModelView Controller) design pattern. Worked as server side developer implementing EJB 1.1 components

University of Bologna (2001-2002)

• "The Anthill Project" main developer and designer. Anthill is an opensource project in peertopeer computing, mobile agents and complex adaptive systems. (link date: 14/8/2006 – http://phd.cs.unibo.it/anthill)

• Chosen as Programmer of the Week for the JXTA Project (link date: 14/8/2006 – https://jxta.dev.java.net/BioArchive.htm#Francesco)

• Speaker at the Java Conference 2002 (Milan, 21/05/2002) – Integration with Java & XML JXTA Technology: Infrastructure, Interoperability and Integration (link date: 14/07/2002 – http://www.sun.it/eventi/javaconference2002/presentazioni_pdf/21-05-nepotiuniv.pdf no more active) (link date: 14/07/2002 – http://www.sun.it/eventi/javaconference2002/popup/pop21_2.html no more active)

SKILLS

Languages: English (good, both spoken and written), Italian (mother-tongue)

Programming Languages: Java, Swift, NodeJS, Python, SQL, Bash

Cloud: AWS, Google Cloud Platform

BigData: Cassandra, ElasticSearch, Splunk

Databases: Aurora, Oracle 10g, MySQL, IBM DB2

Application Servers: Oracle 10g, JBoss AS, Glassfish

Operating Systems: Linux (good), Apple OS X (good), Solaris (poor), Microsoft Windows

Java Specifications: JEE 5, JMX, JMS, JDO, JPA, JAXR, JAXWS, JAXB, JSP, ClassLoader internals

Java Troubleshooting & Diagnostic Tools: JConsole, jstack, jmap, HAT

Integration: Oracle BPEL, Sonic Enterprise Service Bus, WebServices

Testing: JUnit, JTR, Mockito, EasyMock, Hamcrest

Other: Spring, UML, UNIX System Programming, System Security and Firewall, Apache WSIF, Apache Ant, Apache Log4j, OSCache, JBoss Cache, DRools, JBoss JBPM, BeanShell, Groovy, GWT, Google Protocol Buffer, Google App Engine, Google Guice, Google Maps API, Thrift, Scribe

My Open Source Projects:

• JEF (Java Evolutionary Framework) http://jefnet.sourceforge.net

• JTR (Java Test Runner) http://jtrunner.sourceforge.net

• P4PS (Pastry for PeerSim) http://code.google.com/p/peersim-pastry/

• Star-Stream http://code.google.com/p/star-stream/

Presentations I did and used in the past:

• *-Stream, a P2P protocol for video-streaming: http://public.iwork.com/document/?a=p1021695424&d=*-Stream_Presentation.key (best viewed with Safari in order to see the animations too)

• JTR at FOSDEM 2009: http://slidesha.re/ygBFNO