FINRA's Use of Cloud Services (Technology)
Wednesday, May 17
3:00 p.m. – 4:00 p.m.

In this session, FINRA shares effective practices and lessons learned from the adoption of Cloud IT service delivery. Panelists discuss motivating factors, expected and actual benefits of Cloud use, re-architecting applications to optimize value, impact on the IT organization, and enabling DevOps Practices. Panelists also cover how to enhance cyber and information security practices within a virtual private cloud (VPC).

Moderator: John Brady
Vice President and Chief Information Security Officer
FINRA Technology, Cyber & Information Security

Panelists: John Hitchingham
Director
FINRA Development Services

Steven Randich
Executive Vice President and Chief Information Officer
FINRA Office of the Chief Information Officer

David Yacono
Senior Director
FINRA Technology, Cyber & Information Security
FINRA's Use of Cloud Services (Technology) Panelist Bios:

Moderator:

John Brady is Vice President in Technology for Cyber and Information Security for FINRA, and is the organization’s Chief Information Security Officer (CISO). In this capacity, he is responsible for all aspects of FINRA’s information and cyber security programs, as well as ensures compliance with related laws and regulations. He oversees staff focused in four primary information security areas: security architecture and controls, security management tools, application security, and identity management. Mr. Brady, along with counterparts in FINRA’s Data Privacy Office, establishes policy and technical controls to ensure information is appropriately protected throughout its lifecycle. He began his career with FINRA more than 10 years ago as the Director of Networks and Firewalls. He then broadened and deepened his technical knowledge by taking on responsibility for server and storage infrastructure, where he led system engineering efforts to expand capacity and performance of Market Regulation systems in response to data volumes growing more than 40 percent year over year. Mr. Brady recently led the establishment, design, and implementation of FINRA’s new data centers and the seamless migration of more than 175 applications from an outsourcer to those new data centers. Prior to the commencement of his work with FINRA in October 2002, Mr. Brady was Director of Networks at VeriSign from 2000 to 2002 and Network Solutions from 1998 to 2000. From 1995 to 1998, he built and operated Citibank’s Internet Web and email services as Vice President, Internet Services. From 1993 to 1995, Mr. Brady worked for Sun Microsystems as Senior Consultant, where he built integrated network systems for prominent customers. Mr. Brady began his professional career as a member of technical staff at The Aerospace Corporation from 1987 to 1993, designing satellite systems and command and control networks for the Air Force Space Command. Mr. Brady holds a bachelor’s degree in Computer and Electrical Engineering from Purdue University of West Lafayette in Indiana, and a master’s degree in Industrial Engineering and Operations Research from the University of California at Berkeley. He also is an (ISC)² Certified Information Systems Security Professional (CISSP).

Panelists:

John Hitchingham is Director of Performance Engineering at FINRA, where he is responsible for driving technical innovation and efficiency across a Cloud application portfolio that processes more than 75 billion market events per day to detect fraud, market manipulation, insider trading and abuse. Mr. Hitchingham has been with FINRA (previously NASD) for 13 years, ensuring the successful delivery of internal and Member-facing systems that integrate analytics, data management, data services, and web. Prior to FINRA, Mr. Hitchingham was a consultant at The Adrenaline Group where he provided technical design and consulting services to startup, media, and telecommunications clients. He began his career in 1994 with SRA (now CSRA) working in financial systems. Mr. Hitchingham has a bachelor’s degree in Electrical Engineering from Rutgers University.

Steven J. Randich, Executive Vice President and Chief Information Officer (CIO), oversees all technology at FINRA. Previously, Mr. Randich served as Co-CIO at Citigroup, and CIO and Global Head of Technology for Citigroup's Institutional Clients Group. Prior to joining Citigroup, he was Executive Vice President of Operations and Technology and CIO at NASDAQ, where he was responsible for all aspects of NASDAQ technology, including applications development and technology infrastructure. From 1996 to 2000, Mr. Randich served as Executive Vice President and CIO for the Chicago Stock Exchange. He was responsible for all technology, trading-floor and back-office operations, and business product planning and development. Prior to joining the Chicago Stock Exchange, Mr. Randich was a Managing Principal at IBM Global Services and a Manager at KPMG. Mr. Randich has an undergraduate degree in computer science from Northern Illinois University and an M.B.A. from the University of Chicago.

David Yacono is Senior Director of Cyber & Information Security at FINRA. His current responsibilities include FINRA’s software security program, which provides security assurance services to a portfolio of more than 100 internally developed systems, as well as FINRA’s third-party risk management program which evaluates, monitors, and manages the cybersecurity risk posed by FINRA’s vendors, cloud providers, and other third-party relationships. Mr. Yacono is also responsible for FINRA’s IT Security Risk Management and Compliance programs, which ensures compliance with IT security standards including FISMA, PCI-DSS, and FBI-CJIS. Since joining FINRA in 1999 he has served in various roles responsible for ensuring the secure and reliable operation of FINRA’s information technology systems, including
security architect and security engineer. Mr. Yacono specializes in the application of information security processes, methodologies, and tools to protect the confidentiality, integrity, and availability of information and information processing systems, with special emphasis on financial services; he has nearly 25 years of experience in cybersecurity. Mr. Yacono earned a Bachelor of Science in Electrical Engineering from the University of Maryland, and holds current certifications as a Certified Information Systems Security Professional (CISSP), a Certified Secure Software Lifecycle Professional (CSSLP), and a Certified Third Party Risk Management Professional (CTPRP).
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Moderator
- John Brady, Vice President and Chief Information Security Officer, FINRA Technology, Cyber & Information Security

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- Steven Randich, Executive Vice President and Chief Information Officer, FINRA Office of the Chief Information Officer
- David Yacono, Senior Director, FINRA Technology, Cyber & Information Security
Topic 1

Making the Case for Cloud Infrastructure
Scale – we put the BIG in “Big Data”

- Over 20+ petabytes of storage
- 100s of complex surveillance queries
- Market reconstruction containing trillions of nodes and edges
- Up to 75 billion events per day
Need for Nimbleness

Market volumes are volatile and steadily increasing

Exchanges are dynamically evolving

Regulatory landscape is changing

Market manipulators innovate
Legacy Pain Points

Did not **scale** well as volumes and workloads increase

Duplication of effort in data **management** (data lifecycle, retention, versioning, etc.)

**Data sync** issues – manual effort to keep data in sync

Challenging to run **analytics** across fragmented data

**Costly** system maintenance and upgrades
Summary of Cloud Drivers

• Fast-growing data volumes YoY
• High cost of pre-building for peak
• Escalating costs of in-house technology infrastructure
• Appliance platforms were facing obsolescence and end-of life as a result of new Big Data technologies

Keep spending more on legacy infrastructure or redirect dollars to core business of regulation?
Topic 2

Organizing for Successful Cloud Adoption
Expertise Wanted

Fail fast, fail cheap

API
Scala
Spark
Hadoop
BIG DATA

Innovation
Automation
Curiosity

Python
JAVA
CLOUD

Vendors
New Hires
Train Existing
Processes & Strategy

Agile Development

DEV
- Develop
- Automated Test
- Plan
- Measure
- Operate

OPS
- Release Management
- Ops
- Dev
- Build

OPEN SOURCE

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Topic 3

Cloud Security
Evaluating & Managing Cloud Risks

Private Infrastructure:
- Same Risks
- Similar Controls
- Capital Investment
- Lost Opportunities

VPC Security Benefits:
- Easy micro-segmentation
- Fine-grained entitlements
- Strict separation of duties (SoD)
- Automation = consistent compliance
- Rich audit trail
- Cloud and DevOps = more rapid patching
- Best-of-breed security services (e.g., KMS)
- Resilience and multiple recovery options
- Assurance through 3rd Party assessments
- Cloud provider must be secure to survive
Topic 4

Lessons Learned and Surprises
In Hindsight…

- Were there any surprising benefits?
- How about unexpected challenges?
- If you could do it over, what would you do differently?
- What comes next with FINRA’s use of Cloud?
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Resources

FINRA Resources

- Presentation given by FINRA Technology at Amazon Web Services (AWS) re:Invent 2016: FINRA: Building a Secure Data Science Platform on AWS
  
  Slides: [www.slideshare.net/AmazonWebServices/aws-reinvent-2016-finra-building-a-secure-data-science-platform-on-aws-bdm203](http://www.slideshare.net/AmazonWebServices/aws-reinvent-2016-finra-building-a-secure-data-science-platform-on-aws-bdm203)