

A scenic view of a canal in Amsterdam, Netherlands, during sunset. The canal is filled with water, and several boats are docked along the right bank. The buildings are illuminated by the warm light of the setting sun. A tram is visible on the right side of the canal. The sky is a mix of blue and orange.

# HOW OUR SREs SAFEGUARD NANOSECOND PERFORMANCE – AT SCALE – IN AN ENVIRONMENT BUILT TO FAIL

JILLIAN HAWKER

optiver 

A woman with blonde hair tied back, wearing a green t-shirt, is smiling and looking towards the camera. She is sitting at a desk in a trading room, with several computer monitors displaying data and charts. In the background, another person is visible, working at a desk.

## A DIFFERENT PERSPECTIVE ON SRE

1. UNDERSTANDING THE TRADING ENVIRONMENT

2. EXPERIENCING DISASTER

3. MITIGATING THE RISK



# MARKET MAKING

WHAT IS A MARKET MAKER?

EXCHANGES NEED MARKET MAKERS

TODAY, EXCHANGES ARE ELECTRONIC



# OUR PRODUCTION ENVIRONMENT

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# EXPERIENCING DISASTER

The New York Times

## Knight Capital Says Trading Glitch Cost It \$440 Million

BY NATHANIEL POPPER AUGUST 2, 2012 9:07 AM



Troubled broker Knight Capital may be for sale



U.S. MARKETS AUGUST 1, 2012 / 8:36 PM / UPDATED 9 YEARS AGO

Error by Knight Capital rips through stock market



**Knight Capital fined \$12M for trading violations**

THE WALL STREET JOURNAL.

## Loss Swamps Trading Firm

Knight Capital Searches for Partner as Tab for Computer Glitch Hits \$440 Million

FINANCIAL TIMES

Knight Capital glitch loss hits \$461m

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# HOW DO YOU RETAIN CONTROL?

- EXPLICIT CHANGES
- IN-HOUSE APPLICATIONS
- SIMPLIFIED TRADING STACK
- PHYSICAL HARDWARE



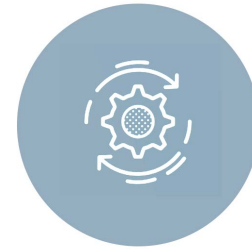
# MITIGATING THE RISK



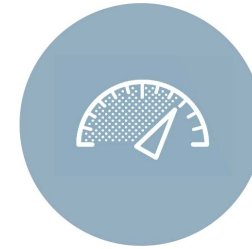
**MILLIONS OF**  
TRADES PER DAY ON  
> **60 EXCHANGES**



**600** DIFFERENT  
APPLICATIONS



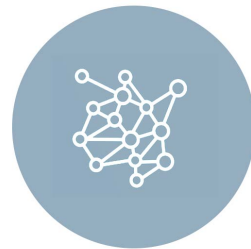
**35.000** CHANGES  
PER YEAR



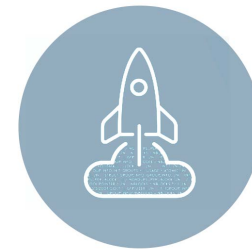
MOVING **230TB** OF  
DATA A DAY AT **10GB**  
A SECOND



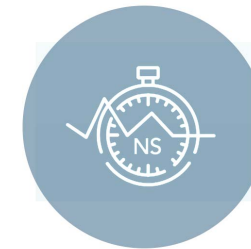
**1500**  
SERVERS GLOBALLY



**10.000** HIGHLY  
CUSTOMIZED  
COMPONENTS



**14.000** RELEASES  
PER YEAR



LATENCY OPTIMISED  
TO **NANOSECONDS**



**"CULTURE BEATS STRATEGY EVERY TIME"  
BETSY BEYER, SITE RELIABILITY ENGINEERING**

**JILLIANHAWKER@OPTIVER.COM  
VISIT OUR VIRTUAL BOOTH!**

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