APRIL 13, 2017 | SAN FRANCISCO

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Advanced Analytics and Machine Learning in Splunk

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Why Machine Learning?

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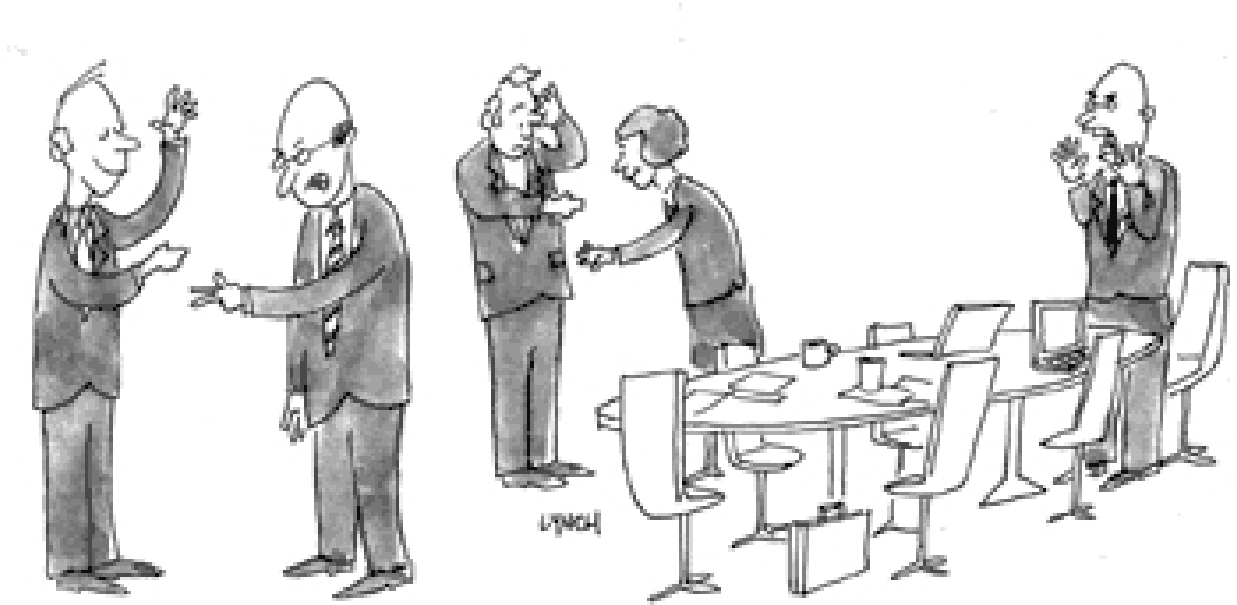
Humans are good at
learning, but we get lost
in volume and details...

Why Do We Need Machine Learning?

- Improve decision making
- Uncover hidden trends or relationships
- Alert on deviations
- Forecast or anticipate incidents

All of this requires diverse data from across many silos. Lots of unstructured, real-time data.



"Now that we've made our first billion, we gotta stop making decisions by playing 'paper, scissors, rock.'"

Run the Business in Real Time

What is Machine Learning?

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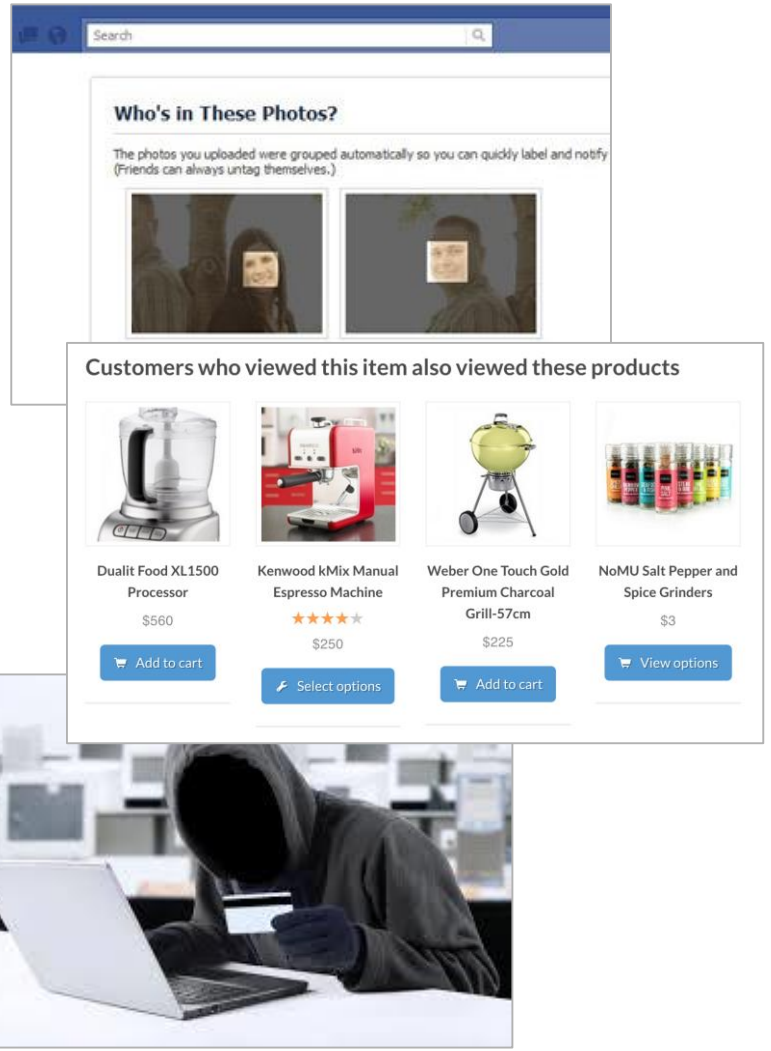
ML is All Around You!

- **Face detection:** find faces in images
- **Spam filtering:** identify SPAM messages
- **Shopping recommendations:** predict what customers would like to buy
- **Fraud detection:** identify credit card transactions which may be fraudulent in nature
- **Weather forecast:** predict whether or not it will rain tomorrow; estimate daily max/min



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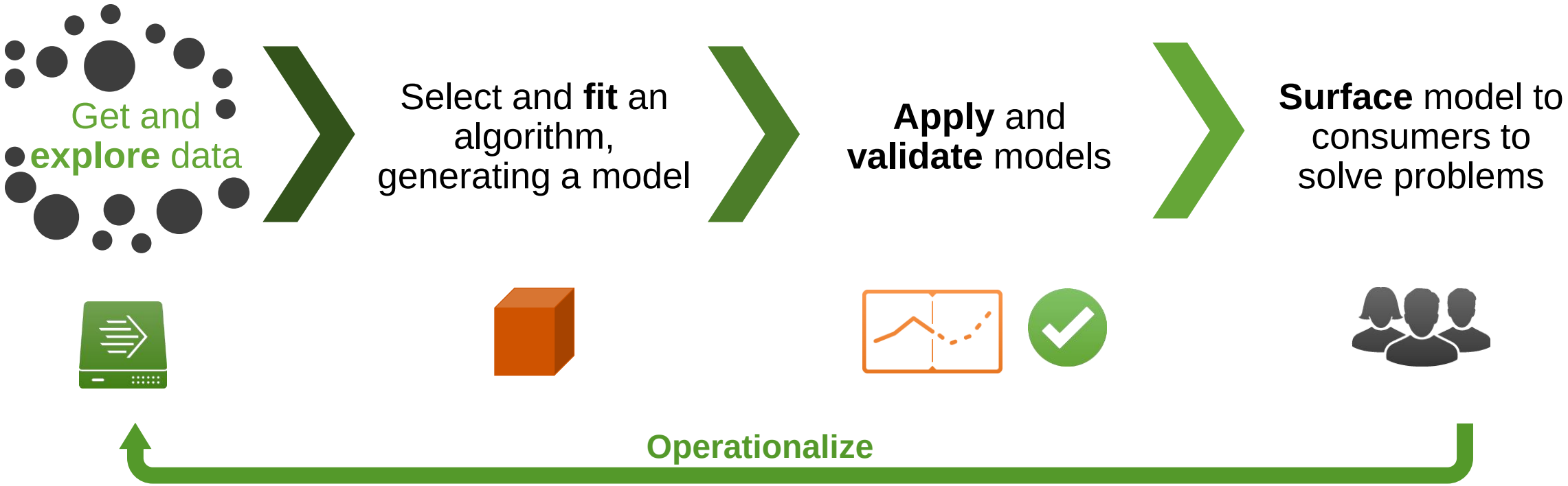
The ML Process

Problem: <Stuff in the world> causes big time & money expense. Value Hypothesis

Solution: Build ML model to forecast <possible incidents>, act pre-emptively & learn



Splunk's Machine Learning Tour

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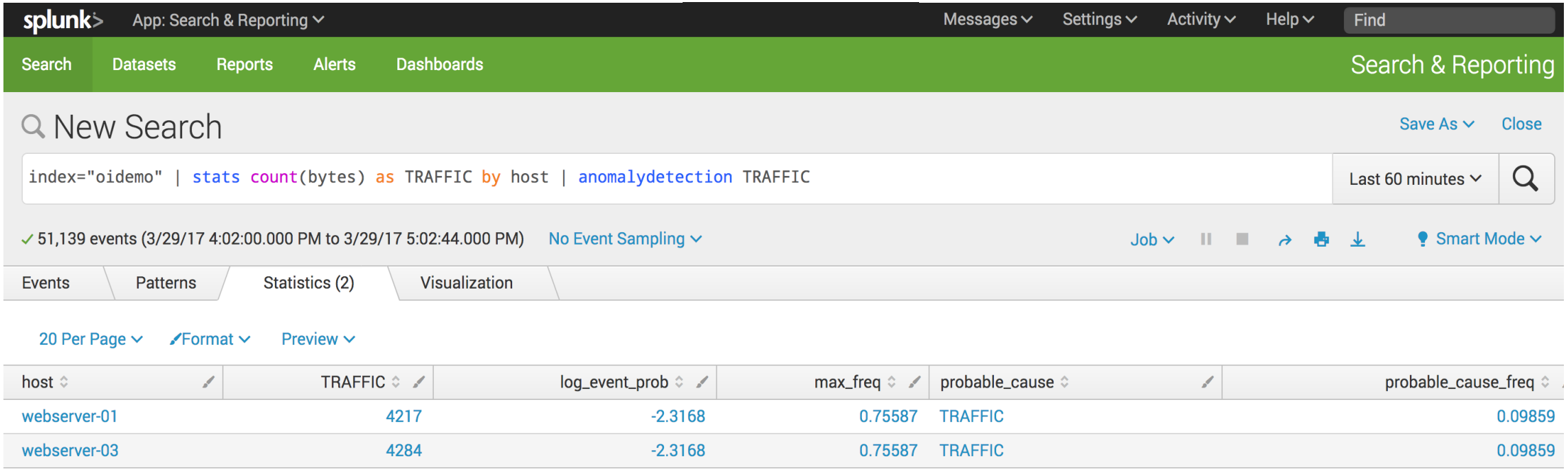
Overview of ML at Splunk

Search Includes Machine Learning

Core Platform Search is a powerful and highly flexible interface built with ML



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Splunk IT Service Intelligence

One of several Premium Solutions with Packaged ML

Define services, entities and KPIs

Monitor and troubleshoot

Analyze and detect

Data-Defined, Data-Driven Service Insights

Adaptive Thresholds and Anomaly Detection

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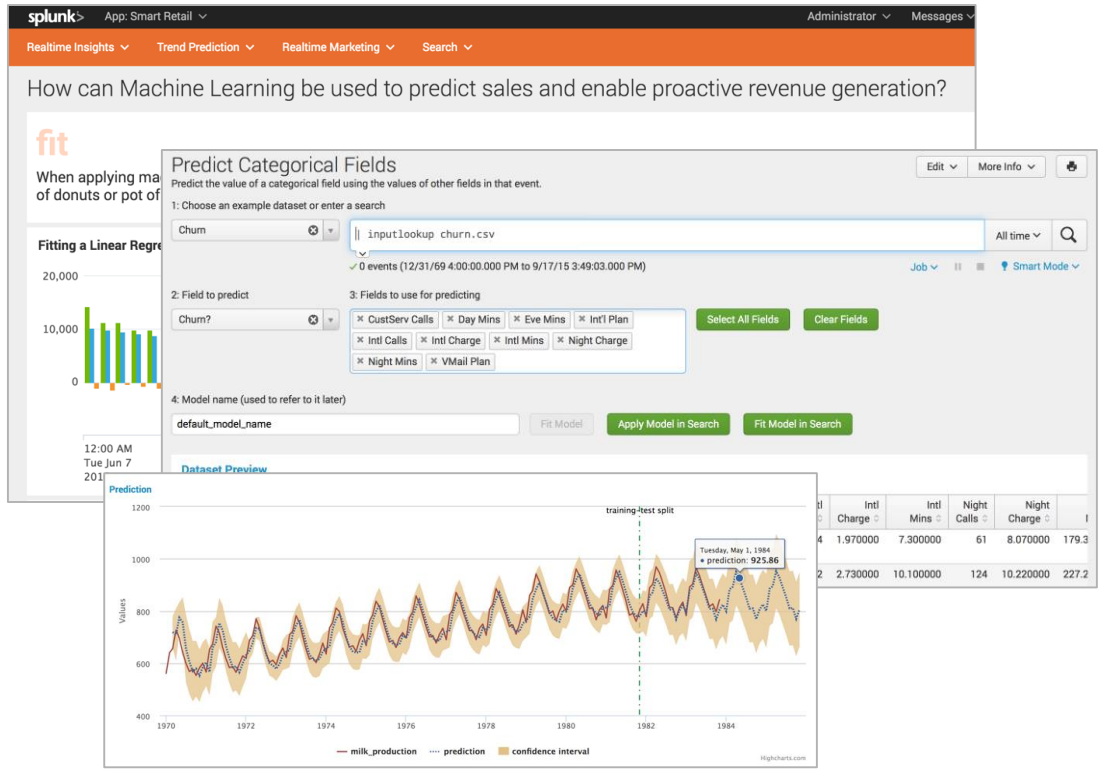
Splunk Machine Learning Toolkit

Extends Splunk platform functions and
provides a guided modeling environment

- **Assistants:** Guided model building, testing and deployment for common objectives
- **Showcases:** Interactive examples for typical IT, security, business and IoT use cases
- **Algorithms:** 25+ standard algorithms included with the toolkit
- **ML Commands:** New SPL commands to fit, test and operationalize models
- **Python for Scientific Computing Library:** Access to 300+ open source algorithms



Build custom analytics for any use case

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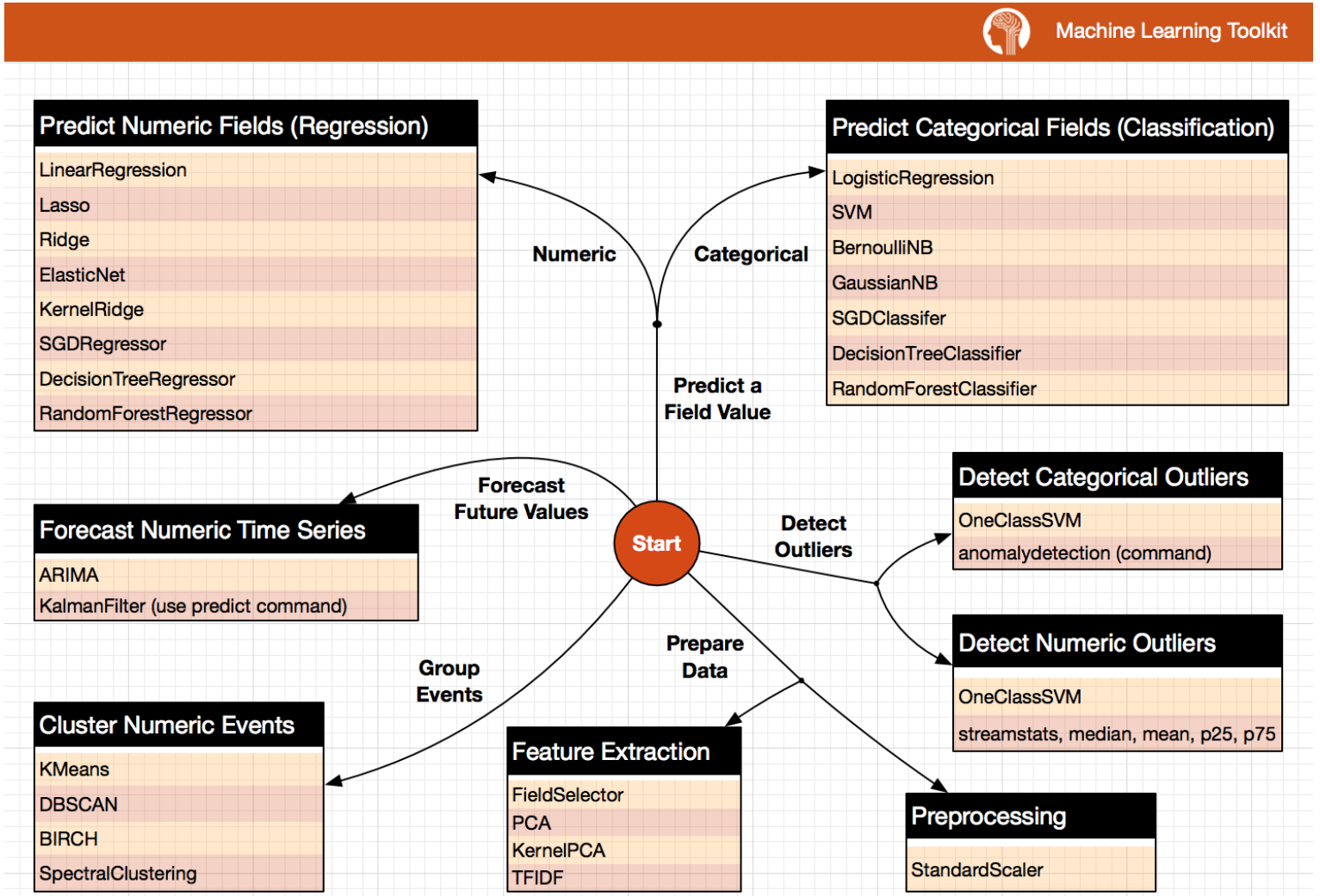
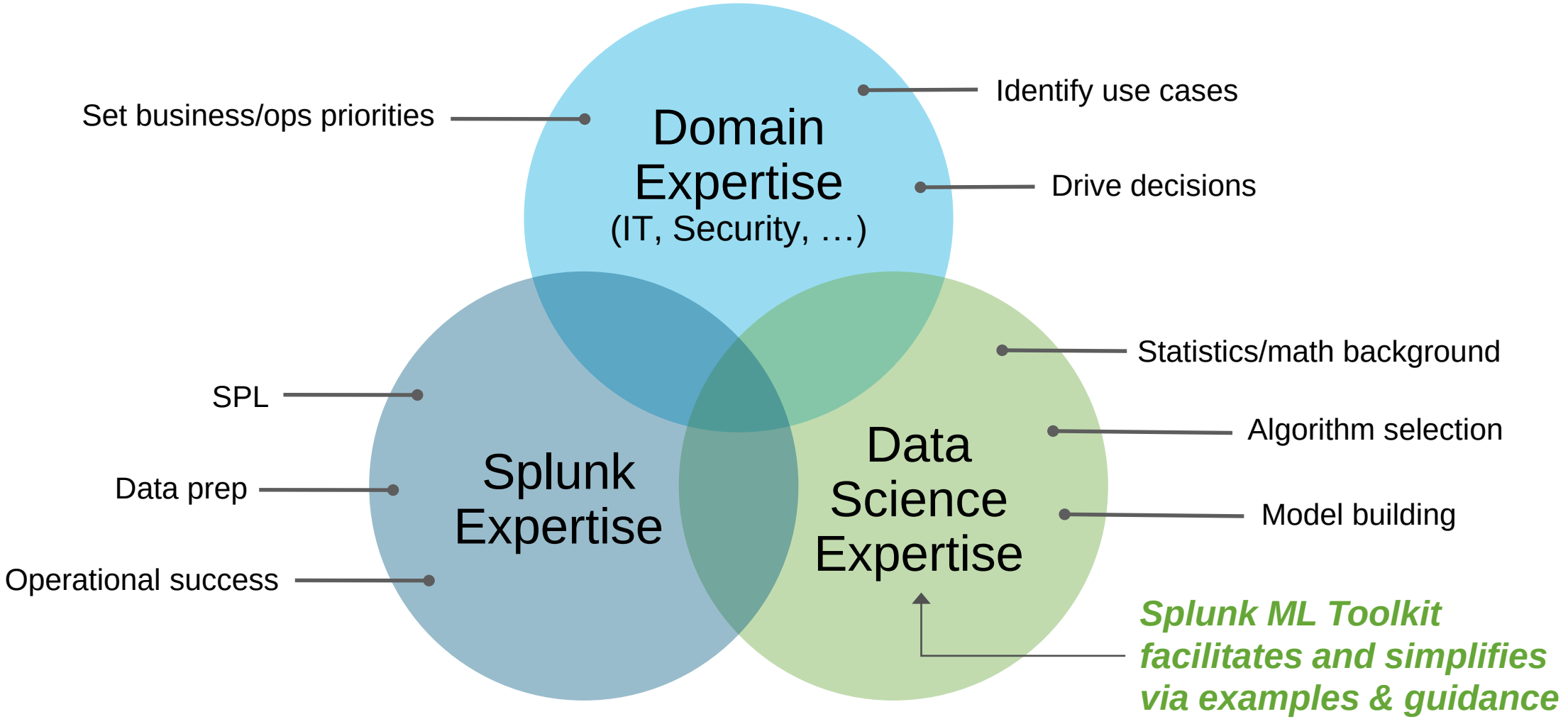
Algorithms Supported (v2.0)



Custom Machine Learning – Success Formula



Splunk Architecture and Machine Learning

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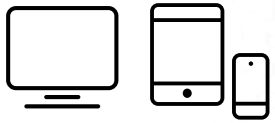
Continuous Data Ingest at Scale

Industrial Assets



Consumer and Mobile Devices

OT

IT

Industrial Data
SCADA, AMI, Meter Reads

Native Inputs
TCP, UDP, Logs, Scripts, Wire, Mobile

Modular Inputs
MQTT, AMQP, COAP, REST, JMS

HTTP Event Collector
Token Authenticated Events

Technology Partnerships
Kepware, AWS IoT, Cisco, Palo Alto

Engineers | Data Analysts | Security Analysts | Business Users

Search | Alert | Visualize | Predict | Develop

Real Time

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External Lookups/Enrichment

Asset Info | Maintenance Info | Data Stores

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Sense and Respond

Every Search Can Use Machine Learning

Industrial Assets

Consumer and Mobile Devices

OT

Real Time

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Search

Alert

Flash lights

Email

Send an email

Tickets

File a ticket

Third-Party Applications

Trigger process flow

Smartphones and Devices

Send a text

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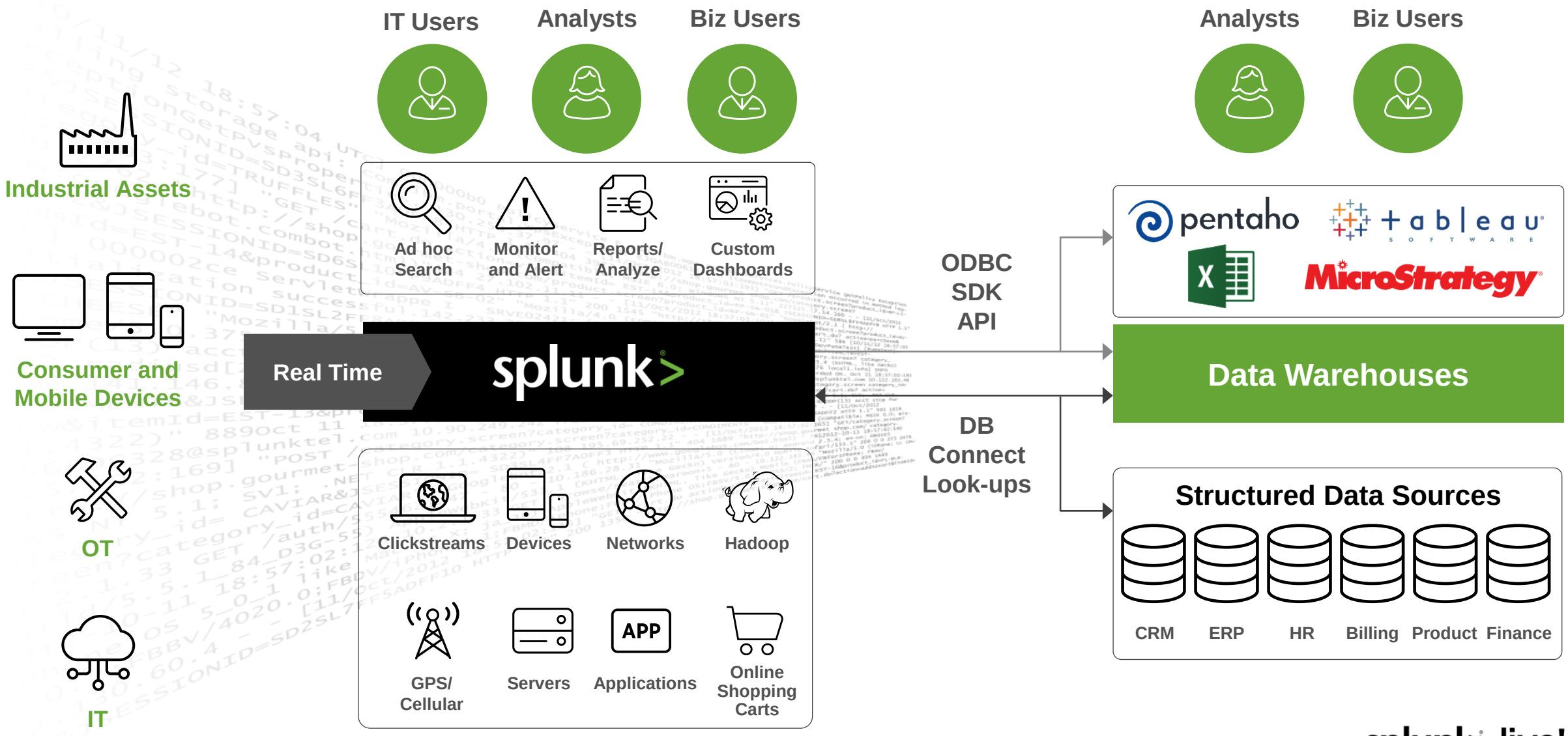
Splunk: Data Fabric



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Show me the ML!

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ML Use Cases and Customer Stories

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Machine Learning Customer Success

TELUS

Network Incident Detection
Service Degradation Detection

NTT docomo

Security / Fraud Prevention

Telco

Cell Tower Incident Detection
Optimize Repair Operations

Zillow

Prioritize Website Issues
and Predict Root Cause

Entertainment Company

Predict Gaming Outages
Fraud Prevention

CONCANON
INSIGHT ON DEMAND

Machine Learning
Consulting Services

SCIANTA ANALYTICS
DEEP INSIGHT™

Analytics App Built
on ML Toolkit

Optimizing operations and business results

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ML Toolkit Customer Use Cases

TELUS

- Reducing customer service disruption with early identification of difficult-to-detect network incidents
- Minimizing cell tower degradation and downtime with improved issue detection sensitivity

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Zillow

- Speeding website problem resolution by automatically ranking actions for support engineers

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NTT docomo

- Ensuring mobile device security by detecting anomalies in ID authentication

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Entertainment Company

- Predicting and averting potential gaming outage conditions with finer-grained detection
- Preventing fraud by Identifying malicious accounts and suspicious activities

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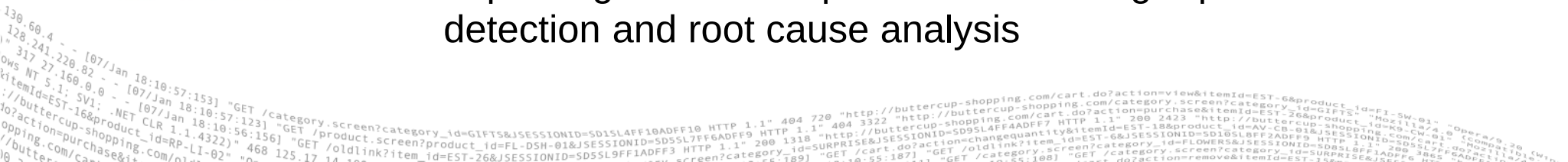
Telco

- Improving cell tower uptime and reducing repair truck roles with anomaly detection and root cause analysis



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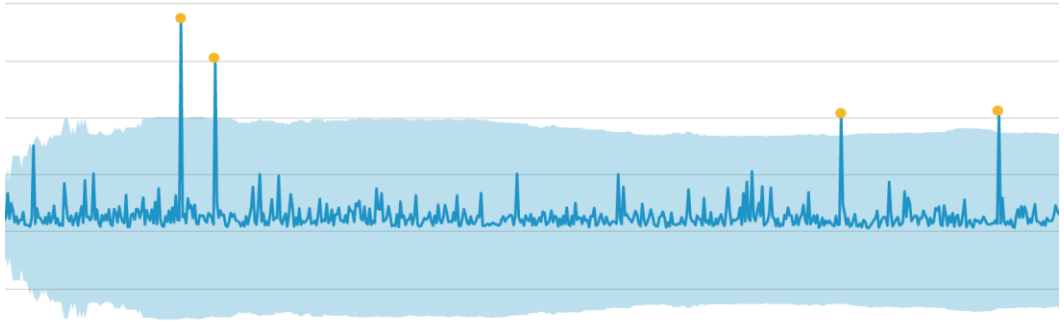
Detect Network Outliers

Reduced downtime + increased service availability = better customer satisfaction



ML Use Case

- Monitor noise rise for 20,000+ cell towers to increase service and device availability, reduce MTTR

Technical Overview

- A customized solution deployed in production based on outlier detection
- Leverage previous month data and voting algorithms

“The ability to model complex systems and alert on deviations is where IT and security operations are headed … Splunk Machine Learning has given us a head start...”

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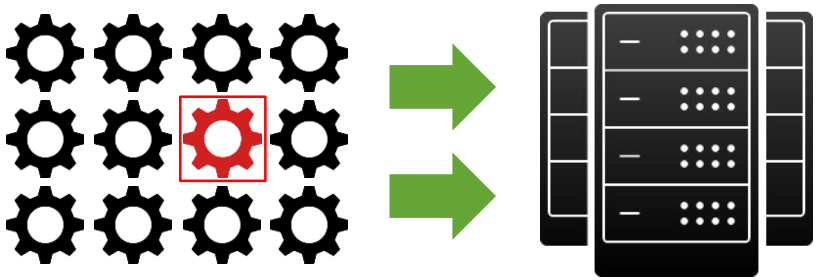
Reliable Website Updates

Proactive website monitoring leads to reduced downtime



ML Use Case

- Very frequent code and config updates (1000+ daily) can cause site issues
- Find errors in server pools, then prioritize actions and predict root cause

Technical Overview

- Custom outlier detection built using ML Toolkit Outlier assistant
- Built by Splunk Architect with no Data Science background

“Splunk ML helps us rapidly improve end-user experience by ranking issue severity which helps us determine root causes faster thus reducing MTTR and improving SLA”

Wrap Up

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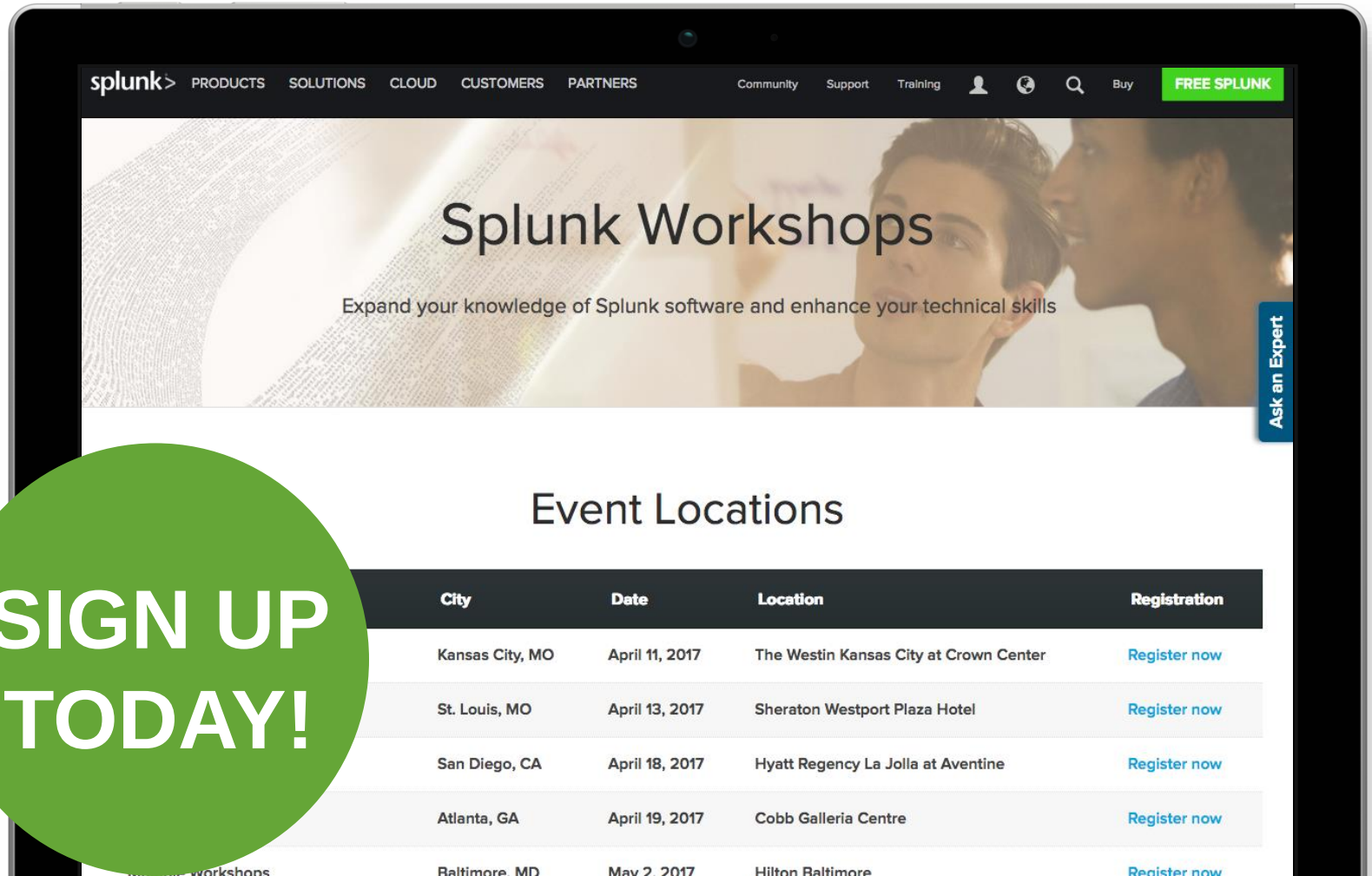
What Else?

- Get the Machine Learning Toolkit from Splunkbase
- Go watch Machine Learning Videos on Splunk YouTube Channel http://tiny.cc/splunkmlvideos
- Go watch the Machine Learning talks from .conf2016:
  - Advanced Machine Learning in SPL with the Machine Learning Toolkit by Jacob Leverich
  - Extending SPL with Custom Search Commands and the Splunk SDK for Python by Jacob Leverich
- Early Adopter and Customer Advisory Program: mlprogram@splunk.com
- Field ML Architects: Andrew Stein (astein@), Brian Nash (bnash@)

Workshops: Get Splunk Hands-on Experience

Attend a Splunk Workshop

splunk.com/workshops



SIGN UP TODAY!

May 23: San Francisco

- **Venue:** Sheraton Fisherman's Wharf
- **Time:** 8:30am
- Register Soon!
  - splunk.com/workshops

May 25: Sacramento

- **Venue:** Hyatt Regency Sacramento
- **Time:** 8:30am
- Register Now!
  - splunk.com/workshops

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Thank you!