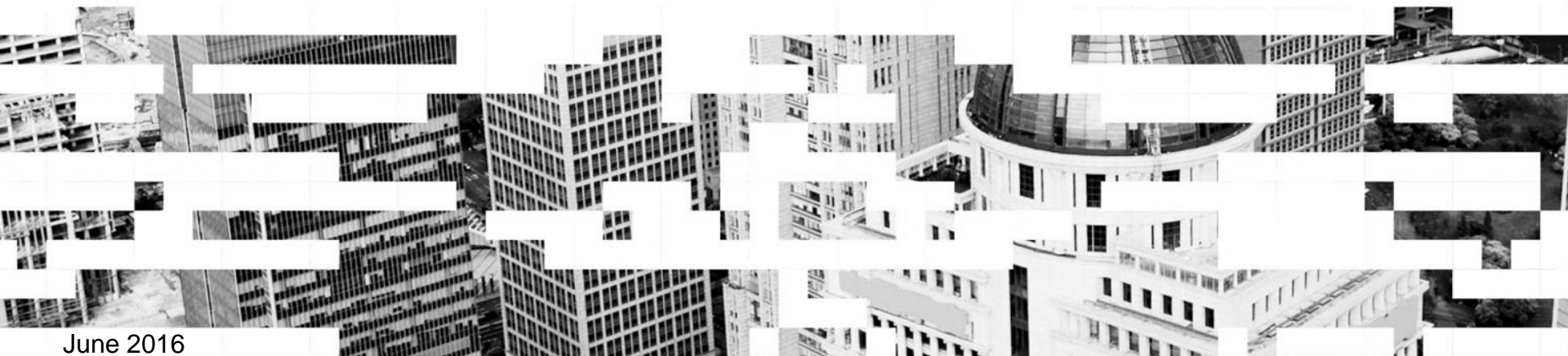


EVENT- DRIVEN FEEDS

PRODUCT OVERVIEW

Bloomberg
FOR ENTERPRISE

June 2016



PRODUCT OVERVIEW

TEXTUAL NEWS

Raw Stories



Bloomberg



Web Scrapes



Third Party



Social Media

Metadata



Tickers



Topics



People



Hits

NEWS ANALYTICS

Story-Level



Sentiment



Market Moving
Score

Company-Level



Sentiment



Readership



Readership
Z-score



Publication
Heat

ELEMENTIZED DATA



Corporate
Actions



Company
Events



Global Economic
Indicators



DC Lockups
(Low Latency)



EcoNext NY4
(Low Latency)

TEXTUAL NEWS CONTENT

EXCLUSIVE BLOOMBERG CONTENT

- Bloomberg News, Bloomberg First Word in English & local languages, containing breaking news, flash headlines and full stories
- 130+ bureaus around the world, 2,500+ journalists cover all asset classes

THIRD PARTY CONTENT

- Press releases from Business wire, PR Newswire, Marketwired, Globenewswire, etc.
- Regulatory filings from SEC (EDGAR), LSE (RNS), etc.

WEB SCRAPES

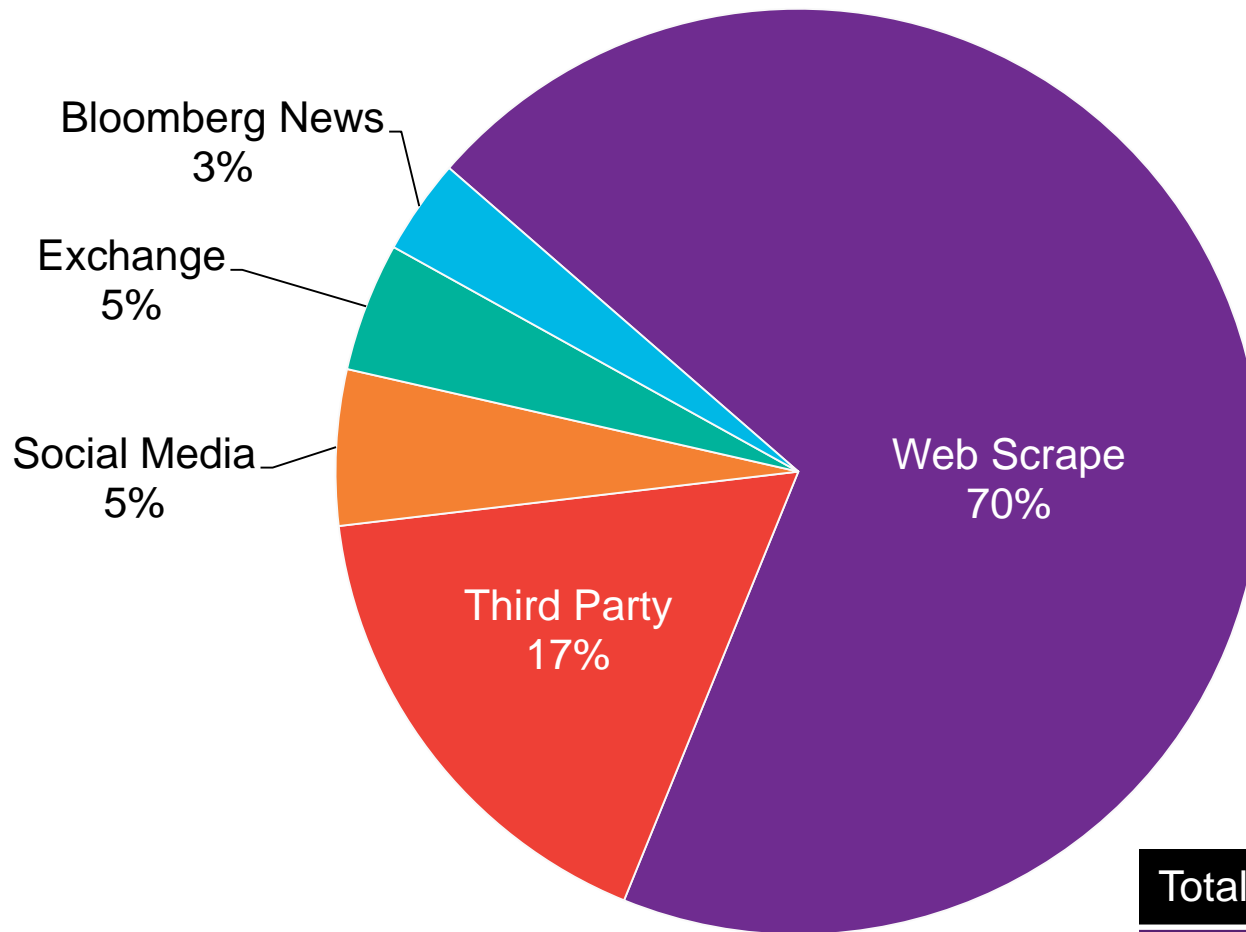
- More than 100,000 companies, financial institutions, central banks, governments, etc.

SOCIAL MEDIA

- From Stocktwits and Weibo. Also Twitter Metadata and **Social Velocity alerts**

TOTAL TEXTUAL NEWS CONTENT

March 2015



Total Wires	1088
Total Stories	16.1 Million

TAGGING AND METADATA OVERVIEW

STORY CLASSIFICATION

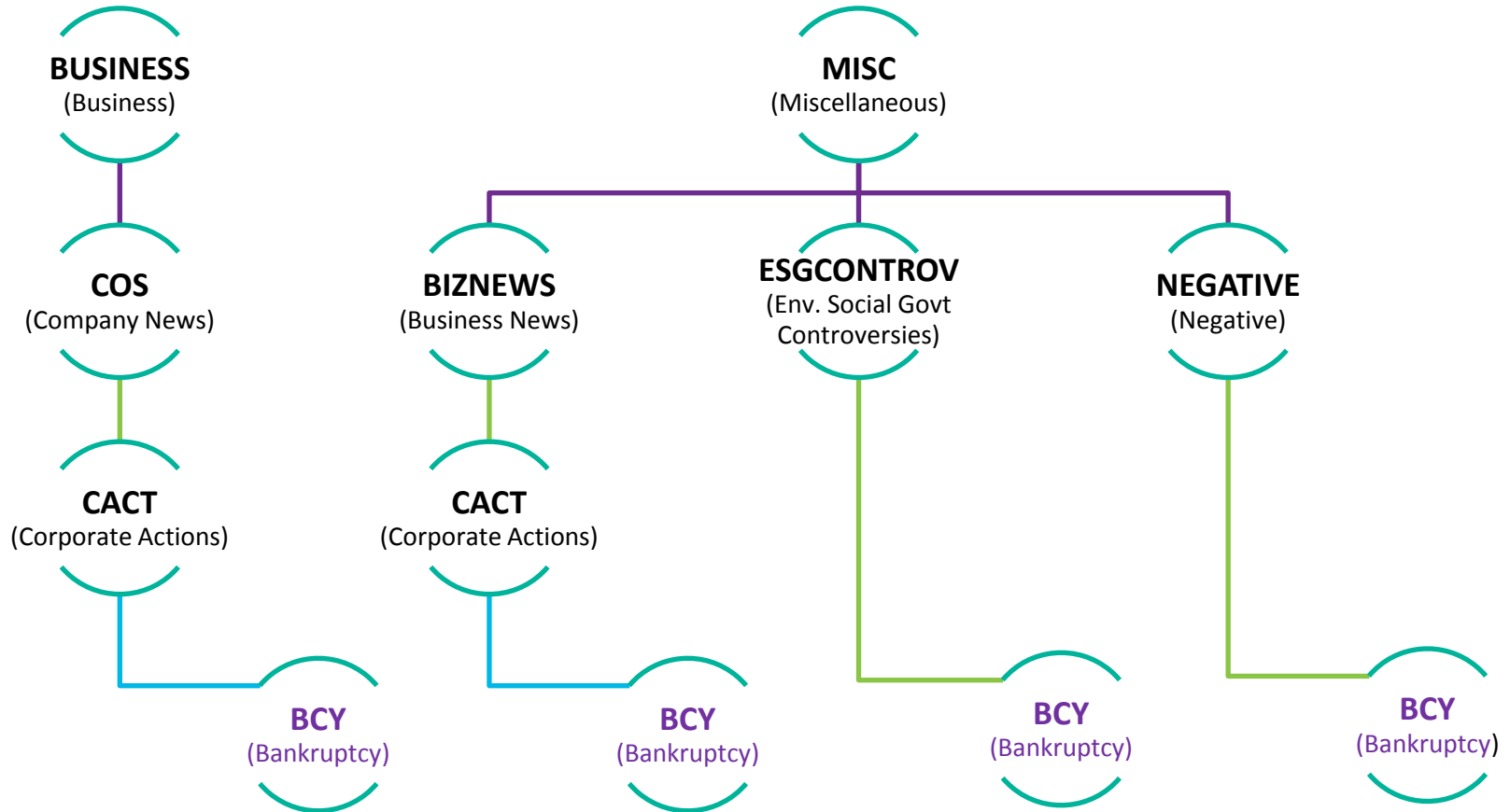
- Stories are tagged to **75,000 companies** and **10,000 topics** by both humans and machines
- Relevance scores are provided for every tag
- Metadata is both assigned and derived
 - Assigned tags are added by humans or third parties
 - Derived tags are added by classification rules written by a dedicated team of indexers
 - Machine tagging is consistent across all sources
- Topics and tickers are organised in a machine-readable taxonomy
- Updates to tags after publication are also provided
- **HITS:** Stories are marked as Bloomberg Professional users read the story (from READ25 to READ25000), or when there is a spike in readership or sharing

TICKERS, TOPICS, PEOPLE

STORIES ARE TAGGED TO:

- **Equities** (parent tickers)
 - FIGIs are supplied for companies – mapping can be found via API at <https://openfigi.com/api> or via data licence. Also taxonomy files!
 - E.g. MSFT, VOD@LN
- **Spot FX**
 - E.g. %GBP, %EUR
- **“Topics”**
 - Including Industries, Events, Actions, Locations, Readership
 - Commodities are tagged as topics, e.g. Metals, Lumber, Livestock, Foods, Energy, Oils & fuels
- **People**
 - 2 million people, including politicians, executives, central bankers, etc.

TOPIC TAXONOMY EXAMPLE



EXPLORING THE TAXONOMY

TERMINAL FUNCTIONS

- Function to explore taxonomy: NIF <GO>
- How to find tags on a story
- Terminal search functions: CN, NI, TCNI, TNI, NSE,
- News research functions: NT, NRS, NRR, GN, GT, BSV, BIO

NEWS ANALYTICS

STORY-LEVEL ANALYTICS



- Market Moving Score



- Sentiment Score in Story Level

COMPANY-LEVEL ANALYTICS



- Sentiment & Social Sentiment



- Readership (News Demand)



- Publication Heat (News Supply)



- Readership Z-Score (News Demand)

STORY-LEVEL ANALYTICS



COMPANY SENTIMENT

- “If an investor, holding a long position in this security, were to read this article, would their confidence in their holdings increase, decrease, or remain the same (in the absence of any context)?”
- Based on supervised machine learning methods such as support vector machines, decision trees and regression models
- Statistical model is built for each class from a large curated set of documents categorized by expert human annotators as positive, negative, or neutral
- Testing showed accuracy close to the upper bound of human agreement on sentiment
- Two different sentiment scores: from “traditional” sources such as Bloomberg News and also from social media
- Provides an individual score and confidence indicator for each company mentioned in a story

STORY-LEVEL ANALYTICS



MARKET MOVING SCORE

- Identifies stories that have a high likelihood of causing significant short-term price move in an equity
- Calculated by a machine learning algorithm using features of the story:
 - Specific words and phrases
 - Parts of speech
 - Incidence of currency values, dates, etc
 - Market data of the security in question (market cap, etc).
- Computed predictively as story is published
- The results of Market Moving Score analysis can be seen on the terminal function {MMN<go>}.

COMPANY-LEVEL ANALYTICS



SENTIMENT & SOCIAL SENTIMENT

- An 8 hour window of story-level sentiment is aggregated every 2 minutes and an update is sent if it has changed by at least 0.005
- A 30 minute window of story-level social sentiment is aggregated every minute and an update is sent if it has changed by at least 0.005



PUBLICATION HEAT (NEWS SUPPLY)

- Number of stories tagged to a company that hour, compared to moving average hourly count over last 45 days
- A ranking of equity issuers according to the aggregate publication heat measure can be seen on the terminal function {NRP<go>}.

COMPANY-LEVEL ANALYTICS



READERSHIP (NEWS DEMAND)

- Readership heat score uses both story hits and the number of searches for tickers. (Each search counts as 10 hits.) The heat final score uses 1-hour hits and the average hourly hits for the past 8 hours to compare against four thresholds.
- $\# \text{ hits} = (\# \text{ reads}) + 10 \times (\# \text{ searches})$
- Heat score is based on “hits” in the last hour (moving window with minute granularity) as well as the average over the last 8+ hours (whichever is larger).
- Heat thresholds (0, 1, 2, 3, 4) are recalculated once an hour at which point the heat score is recalculated to take the new thresholds into account. Heat thresholds are, therefore, dynamic to give the Heat calculation some context.
- In the heat threshold calculation, the last 30 days of readership are considered; specifically the last 30 x 24 hours of actual hits.
- Unique to Bloomberg, generated by the 320,000+ Bloomberg Professional user community
- Readership heat measure can be seen on {NRR <GO>}

COMPANY-LEVEL ANALYTICS

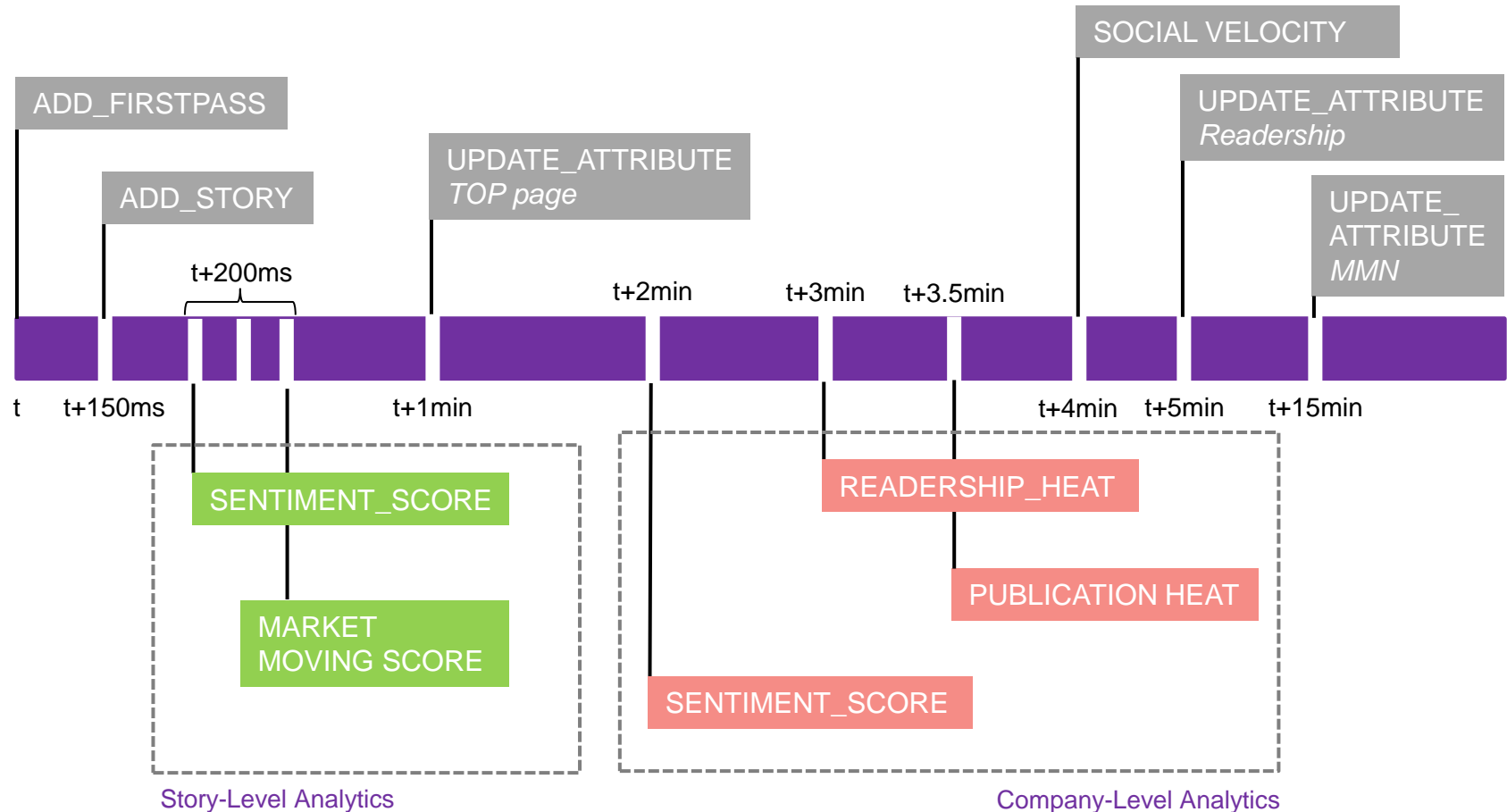


READERSHIP Z-SCORE

- The News Readership indicator provides a normalized measure for the aggregate news consumption related to individual companies.
- The News Readership indicator is one of Bloomberg's unique news analytics based on the statistics of overall user behaviors. It provides clients a powerful real-time tool to always stay informed of the latest hot spots and developing trends.
- The News Readership is a company-level analytic. The value is an unbounded floating point number that is updated every minute. It measures the readership behavior on a rolling one-hour basis.

EXAMPLE STORY TIMELINE

BLOOMBERG EXCLUSIVE STORY



Fictitious example. Not to scale. Timings are indicative only.

EXAMPLE TEXTUAL NEWS FIRST PASS MESSAGE

```
<ContentT EID="34151" CaptureTime="2015-09-21T07:06:38.737+00:00"
  Origin="API" SchemaVersion="2015-06-23T11:59:00.000+00:00">
  <StoryContent>
    <Id>
      <SUID>NV0MF26JIV4</SUID>
    </Id>
    <Event>ADD_1STPASS</Event>
    <Story Content Type="Current">
      <Version>UPDATE</Version>
      <Metadata>
        <WireId>25</WireId>
        <ClassNum>88</ClassNum>
        <WireName>BN</WireName>
        <Headline>Volkswagen Drops 15% After Admitting U.S. Diesel Emissions
          Cheat</Headline>
        <TimeOfArrival>2015-09-21T07:06:38.714+00:00</TimeOfArrival>
      </Metadata>
      <LanguageId>1</LanguageId>
      <LanguageString>ENGLISH</LanguageString>
      <VendorId></VendorId>
      <TextEncoding>1252</TextEncoding>
      <HotLevel>0</HotLevel>
      <AssignedTickers>
        <ScoredEntity>
          <Id>VOW@GR</Id>
          <Score>95</Score>
        </ScoredEntity>
      </AssignedTickers>
      ...
    </Story>
  </StoryContent>
</ContentT>
```

Story identifier is common across all textual news and analytics messages

Wire Number/Wire Code identify the source of the story – in this case, Bloomberg News (BN)

Headline is consistent between first pass & add story messages

The time of arrival of the story in Bloomberg's news database

Story Tags are split into assigned / derived and tickers / topics / people. All relevance scores are set to 70 (except if there is only one equity ticker, in which case it will score higher).

This metadata section has been shortened to fit the space on this slide.

EXAMPLE TEXTUAL NEWS ADD STORY MESSAGE

```
<ContentT EID="34151" CaptureTime="2015-09-21T07:06:38.972+00:00"  
  Origin="API" SchemaVersion="2015-06-23T11:59:00.000+00:00">  
  <StoryContent>
```

Story identifier is common across all textual news and analytics messages

```
    <Id>  
      <SUID>NV0MF26JIJV4</SUID>  
    </Id>  
    <Event>ADD_STORY</Event>  
    <Story ContentType="Current">  
      <Body> By Naomi Kresge (Bloomberg) -- Volkswagen AG dropped 15 percent, the most in almost six years, after it admitted to  
        cheating on U.S. air pollution tests for years. ... </Body>
```

The story body includes the entire text of the story, as would be seen on the Bloomberg terminal. It is only sent in the second pass message. *It has been truncated here to fit on the slide.*

```
      <BodyTextType>STYTYPE_PLAIN_TEXT</BodyTextType>  
      <Version>ORIGINAL</Version>  
      <Metadata>  
        <WireId>25</WireId>  
        <ClassNum>88</ClassNum>  
        <WireName>BN</WireName>  
        <Headline>Volkswagen Drops 15% After Admitting U.S. Diesel Emissions Cheat</Headline>  
        <TimeOfArrival>2015-09-21T07:06:38.714+00:00</TimeOfArrival>  
        <StoryGroupId>NUZGW66KLVR501</StoryGroupId>
```

Headline is consistent between first pass & add story messages

```
      </Metadata>  
      <HeadlineClusterId>BSQsXqEu9Ivie3ntg/jQRWA==</HeadlineClusterId>  
      <LanguageId>1</LanguageId>  
      <LanguageString>ENGLISH</LanguageString>  
      <Slug>VW-Mover</Slug>  
      <TopicClusterId>NUZGW66KLVR501</TopicClusterId>  
      <TextEncoding>1252</TextEncoding>  
      <HotLevel>0</HotLevel>  
      <TimeOfUpdate>2015-09-21T07:06:38.770+00:00</TimeOfUpdate>
```

```
      <AssignedTickers>  
        <ScoredEntity>  
          <Id>VOW@GR</Id>  
          <Score>96</Score>  
        </ScoredEntity>
```

The metadata section is expanded to include any machine-derived tags, as well as parent codes from the taxonomy. Relevance scores are also provided for machine-derived tags.

```
      </AssignedTickers>
```

```
    <StoryGroup>
```

```
      <Id>NUZGW66KLVR501</Id>
```

StoryGroup can be used to see if story is an update or not

```
      <Type>1</Type>
```

```
      <Description>No description available</Description>
```

```
      <Creation>2015-09-21T07:06:38.959+00:00</Creation>
```

```
      <LastUpdate>2015-09-21T07:06:38.959+00:00</LastUpdate>
```

```
      <OrphanAttachmentExpiration>2015-09-21T07:06:38.959+00:00</OrphanAttachmentExpiration>
```

```
    </StoryGroup>
```

```
    <HybridTopicClusterId>NUZ7C06JIJZK</HybridTopicClusterId>
```

```
  </Story>
```

```
</StoryContent>
```

```
</ContentT>
```

EXAMPLE STORY ANALYTICS MESSAGE

```
<ContentT EID="60911" CaptureTime="2015-09-21T07:06:38.952+00:00"
Origin="API" SchemaVersion="2015-06-23T11:59:00.000+00:00">
  <StoryAnalytics>
    <Id>
      <SUID>NV0MF26JIV4</SUID>
    </Id>
    <Metadata>
      <WireId>25</WireId>
      <ClassNum>88</ClassNum>
      <WireName>BN</WireName>
      <Headline>Volkswagen Drops 15% After Admitting U.S. Diesel
        Emissions Cheat</Headline>
      <SourceId>SENTSVC</SourceId>
      <TimeOfArrival>2015-09-21T07:06:38.710+00:00</TimeOfArrival>
    </Metadata>
    <StructuredScoreList>
      <AnalyticsType>SENTIMENT</AnalyticsType>
      <StructuredScore>
        <Score>-1</Score>
        <Confidence>98</Confidence>
        <EntityId>VOW@GR</EntityId>
        <EntityType>COMPANY</EntityType>
      </StructuredScore>
      <Version>1</Version>
    </StructuredScoreList>
  </StoryAnalytics>
</ContentT>
```

Note: Story identifier is common across all textual news and analytics messages

This is the story's time of arrival

Story has negative sentiment with high confidence

Other story level analytics messages have a similar format

HISTORICAL ARCHIVES

PRODUCT	DESCRIPTION	ARCHIVE START DATE
TEXTUAL NEWS	Bloomberg News	November 2008
	PR Newswire, Business Wire, Marketwire	March 2009
	Web Scraping	August 2011
NEWS ANALYTICS	Story Level	July 2011 to January 2012
	Company Level	February 2010
ECONOMIC DATA	Worldwide Indicators	March 2012
	Low-Latency DC	April 2011
CORPORATE ACTIONS		August 2009
CORPORATE EVENTS		December 2011

*Access to all historical archives is included with a subscription to any product.
Some back-fills of data exist; others are created on demand.*

CORPORATE ACTIONS & EVENTS



CORPORATE ACTIONS

- Real-time feed from CACS <Go> on the Bloomberg terminal
- Global event data covering 50 unique corporate action types on millions of instruments
- Actions include dividends, listings, spin-offs, splits, ticker changes, rights offerings
- Over 2 million actions covered per year



COMPANY EVENTS CALENDAR

- Real-time feed from EVTS <Go> on the Bloomberg terminal
- Coverage of earnings releases, shareholder meetings, conferences, presentations, earnings calls, sales results, M&A, guidance
- Estimated dates provided for earnings calls up to one year in advance
- Over 300,000 events per year

MACRO ECONOMIC INDICATORS



GLOBAL ECONOMIC INDICATORS

- Thousands of economic releases from ECO <Go>, including central bank rates, GDP, unemployment, industrial production, producer prices, etc.
- 800+ government and third-party sources in 230 countries/geographic locations
- Includes survey data from Bloomberg's exclusive economist surveys
- Next release date is provided through eco calender for advance scheduling

MACRO ECONOMIC INDICATORS



EcoNext NY4 (LOW-LATENCY)

- Delivered via cross-connection in a single, fair, accelerated delivery point in NY4
- Econext is next generation delivery of the **100+ of the most important economic indicators**
- Product released with the latest technology: July 31 2016

EcoNext Sources	
US Department of Agriculture	Federal Reserve Bank of New York
Automatic Data Processing, Inc	Bureau of Economic Analysis
Bank of Canada	Deutsche Bundesbank
STCA - Statistics Canada	Department of Labor
Deutsche Boerse AG	Institute for Supply Management
National Bureau of Statistics	S&P/Case-Shiller
Customs General Administration	Federal Statistics Office of Switzerland
U.S. Census Bureau	Bank of England
University of Michigan	US Treasury
Bureau of Labor Statistics	National Association of Home Builders
Federal Reserve	National Assoc. of Realtors
U.S. Department of Energy	

Economic releases have a systematic effect on almost every market:

- Commodity
- Currency
- Credit
- Futures and Options
- Equities

MACRO ECONOMIC INDICATORS



WASHINGTON DC LOCKUPS (LOW-LATENCY)

- Low-latency feed in wire format
- From the 5 lockups in Washington DC:
 - Federal Reserve
 - Agriculture
 - Treasury
 - Commerce
 - Labor
- Delivered via cross-connection, exclusively in Coresite, Washington DC

TECHNOLOGY

REAL-TIME

- Delivered over Bloomberg's Platform infrastructure, via appliances, as a managed service with transparent failover
- Same architecture as all other real-time Bloomberg Enterprise products, such as market data
- SDK / API is provided to receive the live data on Linux, Sun Solaris, Windows
- C#, C++, Java, Python languages supported
- Data delivered in either XML or json format
- Extensive documentation and sample code are provided

END-OF-DAY

- Complete archive of the previous day's messages
- Files delivered onto an SFTP server 10-15 minutes after midnight EST
- Files are in compressed XML format