



We are now Refinitiv, formerly the Financial and Risk business of Thomson Reuters. We've set a bold course for the future – both ours and yours – and are introducing our new brand to the world.

As our brand migration will be gradual, you will see traces of our past through documentation, videos, and digital platforms.

Thank you for joining us on our brand journey.



REFINITIVTM

The Refinitiv logo, which is a blue L-shaped graphic with a diagonal line extending from the bottom-right corner of the vertical bar.

Thomson Reuters Big Open Linked Data Solutions

Thomson Reuters Knowledge Graph Feed

PermlD Inside

A linked data feed of Thomson Reuters financial content sets with a pre-identified set of relationships helping you uncover previously undetected connections within and across data sets

Proliferation of data in the financial industry increases need for standards, structure and integration. In today's complex digital world there has never been a greater need to achieve structure out of your content in order to organize information and establish links between diverse data types to solve real business challenges.

According to Forrester, by 2017, 25% of enterprises will have implemented a graph database, while Gartner states that "graph analysis is possibly the single most effective competitive differentiator for organizations pursuing data-driven operations and decisions."

Thomson Reuters has considerable data assets that are contributing to the formation of a Thomson Reuters Knowledge Graph.

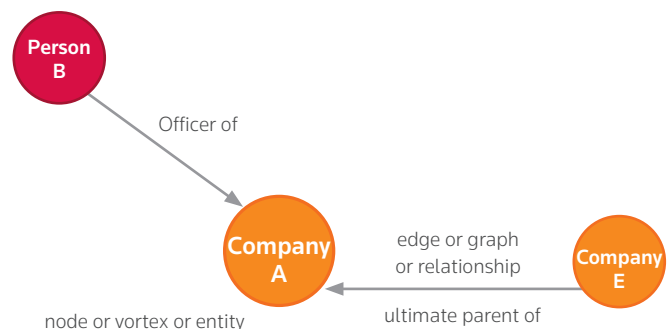
With Thomson Reuters Knowledge Graph feed you have the ability to start incorporating Thomson Reuters content as part of your bigger Institutional knowledge graph – connecting your data world to Thomson Reuters data and 3rd party data. Graphs can also be easily connected to other graphs as long as the graph databases share some common standards – typically around how entities (like people or companies) and relationships are represented. **A feed of Thomson Reuters Knowledge Graph into your infrastructure will make it substantially easier to serve your data relationships discovery and exploration needs across a range of business requirements ranging from investment research to business development through sales Intelligence to financial crime/risk and potentially many more.**

Solve Business Challenges with Thomson Reuters Knowledge graph feed solution

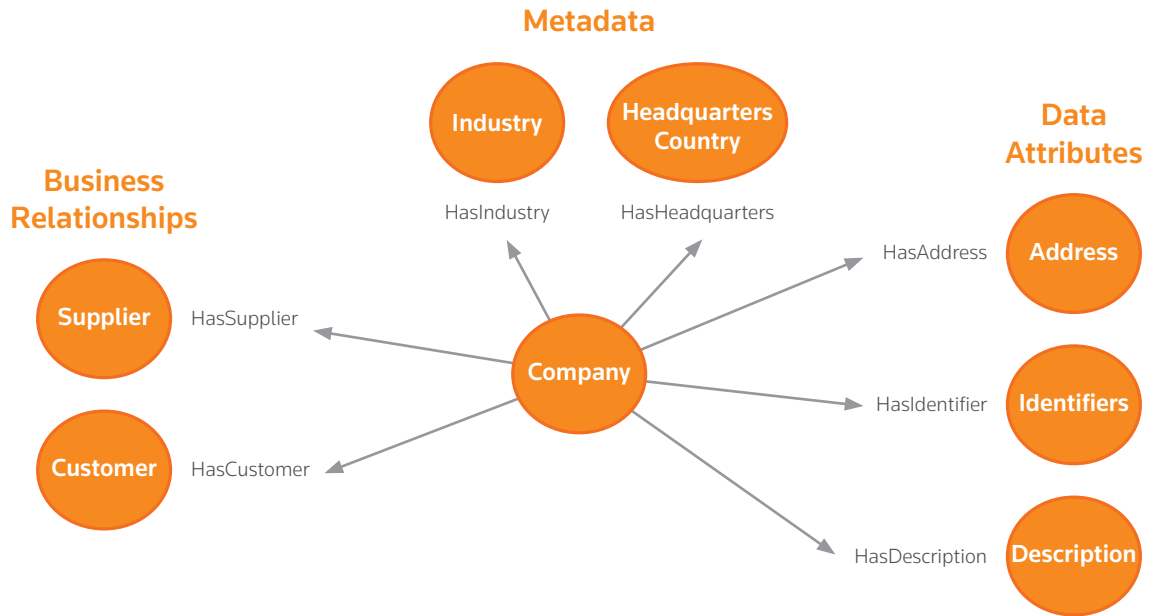
- Improve productivity of your Investment research function by enabling discovery of previously undetected relationships between entities, persons and events which have the potential to affect alpha.
- Improve Business development and Customer Relationship Management (CRM) Systems through rich integration of internal, Thomson Reuters and third party data enabling a graph network of sales leads and connections to be mapped out.

What is Thomson Reuters Knowledge Graph?

Thomson Reuters Knowledge Graph feed is a mean of organizing and representing information. It comprises objects and relations between those objects, such that any pair of objects connected by relation form simple information. Our Knowledge Graph is based on the industry standard Resource Descriptive Framework (RDF) feed model. The RDF-based Knowledge Graph is already reaching billions of triples (Triple is: "john smith – is officer director of – company X"), containing attributes and relationships for entities – such as organizations, people, financial instruments and value chains.



Knowledge Graphs express all information as relationships. All Metadata is expressed as Identifiers which are shared between content types, allowing reliable connections to be made.



Many data items in the graph are uniquely referenced by Thomson Reuters Permanent Identifier (PermID) which is our permanent and machine readable identifier. PermID never changes, helping you handle complex data management challenges, eliminate mapping inconsistencies, reduce risk, and streamline end-to-end workflow processes across various platforms. More information is available [here](#).

The initial release (V1) of the Knowledge Graph feed includes bulk delivery of the following content sets along with specific Metadata:

1. Value Chains

Value Chains is a Thomson Reuters content set that includes Company to Company Supply Chain relationships. In the initial release we cover over 230,000 relationships from over 20,000 companies, supported by over 600,000 supporting evidence text snippets.

Thomson Reuters uses advanced algorithms to identify supplier-customer connections mentioned in publicly available sources. The value chains are identified as organization pairs using PermIDs for the supplier and the customer, as well as a confidence score for the relationship, and the underlying source evidence of the relationship. Selected organization content is included providing links to hierarchies and industries.

Graph Feed (RDF) Example: Supply-chain relationship

```

aggregatedConfidenceScore> "0.9968657846397275"^^<http://www.w3.org/2001/XMLSchema#double> .
created> "2011-07-28T05:22:11.000Z"^^<http://www.w3.org/2001/XMLSchema#dateTime> .
customer> <https://permid.org/1-4297547964> .
customerPermId> "4297547964" .
instanceId> "4295522507_4297547964" .
isActive> "true"^^<http://www.w3.org/2001/XMLSchema#boolean> .
lastUpdated> "2016-02-10T05:30:00.175Z"^^<http://www.w3.org/2001/XMLSchema#dateTime> .
snippetCount> "13"^^<http://www.w3.org/2001/XMLSchema#int> .
supplier> <https://permid.org/1-4295522507> .
supplierPermId> "4295522507" .

```

Triples describing the overall supply chain relationship

2. Core Entities

- **Organizations:** Thomson Reuters provides information on 4 million legal entities worldwide, including core details and hierarchies for issuers of equity and debt, capital markets active private companies, fund management companies and selected public sector organizations.

Graph Feed (RDF) Example: Organizations

```

<http://ont.thomsonreuters.com/mdaas/CommonName> "CorpBanca New York Branch" .
<http://ont.thomsonreuters.com/mdaas/entityLastReviewedDate> "2015-09-18T04:00:00Z"^^<http://www.w3.org/2001/XMLSchema#dateTime> .
<http://ont.thomsonreuters.com/mdaas/equityInstrumentCount> "0" .
<http://ont.thomsonreuters.com/mdaas/hasImmediateParent> <http://permid.org/1-4295863493> .
<http://ont.thomsonreuters.com/mdaas/hasUltimateParent> <http://permid.org/1-5000781484> .
<http://ont.thomsonreuters.com/mdaas/instrumentCount> "442" .
<http://ont.thomsonreuters.com/mdaas/isDomiciledIn> "United States"@en .
<http://ont.thomsonreuters.com/mdaas/isIncorporatedIn> "Chile"@en .
<http://ont.thomsonreuters.com/mdaas/isPublicFlag> "false" .
<http://ont.thomsonreuters.com/mdaas/MXID> "112569735" .
<http://ont.thomsonreuters.com/mdaas/officialLatinName> "CorpBanca New York"@en .
<http://ont.thomsonreuters.com/mdaas/OrganizationProviderTypeCode> "1" .
<http://ont.thomsonreuters.com/mdaas/organizationStatusCode> "Active" .
<http://ont.thomsonreuters.com/mdaas/organizationSubtypeCode> "Organization Branch" .
<http://ont.thomsonreuters.com/mdaas/organizationTypeCode> "Business Organization" .
<http://ont.thomsonreuters.com/mdaas/organizationWebsite> <http://www.corpbancany.com/> .

```

- **People:** In this release, we offer extensive Thomson Reuters people data and their connections to their employers, including company officers and directors, company insiders, financial analysts, attorneys and judges.

Graph Feed (RDF) Example: People

```

<http://OfficersDirectors.schemas.financial.thomsonreuters.com/OfficersDirectors/2014-10-10/oandDAsReportedAge> "57" .
<http://OfficersDirectors.schemas.financial.thomsonreuters.com/OfficersDirectors/2014-10-10/objectTypeld> <http://data.thomsonreuters.com/1-404011> .
<http://OfficersDirectors.schemas.financial.thomsonreuters.com/OfficersDirectors/2014-10-10/oDPersonCIK> "0001326972" .
<http://OfficersDirectors.schemas.financial.thomsonreuters.com/OfficersDirectors/2014-10-10/oDPersonPAId> <http://data.thomsonreuters.com/1-34413177723> .
<http://ont.thomsonreuters.com/permid> "34413177723" .
<http://peoplesmaster.schemas.financial.thomsonreuters.com/2010-11-01/adminStatus> <http://data.thomsonreuters.com/2-0240ef2f901922096d382b30ec633cd3fe8ad0c7c743d2bf423e9cc82de54ba5> .
<http://peoplesmaster.schemas.financial.thomsonreuters.com/2010-11-01/personDateOfBirth> "1959-01-01" .
<http://peoplesmaster.schemas.financial.thomsonreuters.com/2010-11-01/personDateOfBirthPlus> "PIY" .

```

- **Instruments and Quotes:** Thomson Reuters is one of the world's largest sources of equity-related content, with long-standing relationships to markets around the world. Instruments (or securities) are tradable financial assets, such as ordinary shares. Quotes refer to specific locations and markets where those instruments are traded. Initial release coverage consists of 22.7 million instruments and 74.5 million quotes.

Graph Feed (RDF) Example: Instruments and Quotes

```
<http://ont.thomsonreuters.com/mdaas/CommonName> "AEX28D NOV6 449P" .
<http://ont.thomsonreuters.com/mdaas/ExchangeTicker> "A28" .
<http://ont.thomsonreuters.com/mdaas/IsQuoteOf> <http://permid.org/1-21600668699> .
<http://ont.thomsonreuters.com/mdaas/IsTradingIn> "EUR" .
<http://ont.thomsonreuters.com/mdaas/QuoteExchangeCode> "AEX" .
<http://ont.thomsonreuters.com/mdaas/RCSAssetClass> "OPT" .
<http://ont.thomsonreuters.com/mdaas/RIC> "AEX28D44900W6.E" .
<http://ont.thomsonreuters.com/mdaas/TRCSAssetClass> "Equity Cash Options" .
```

- **News metadata:** Since 1850, Reuters has grown to become the world's leading international news agency, providing award-winning coverage of business, finance, politics, sport, entertainment, technology, health, environment and more. We include a small subset of metadata for approximately 17.5 million news articles in the initial release of the Graph Feed, and we plan to extend this metadata substantially in further releases.

Graph Feed (RDF) Example: News

```
<http://purl.org/dc/terms/date> "2016-09-08T02:54:04Z"^^<http://www.w3.org/2001/XMLSchema#dateTime> .
<http://schema.org/headline> "BREAKINGVIEWS-Mario takes Nintendo up a level in mobile gaming" .
<http://www.thomsonreuters.com/ontologies/lbd/entity> <http://data.thomsonreuters.com/1-4295876067> .
<http://www.thomsonreuters.com/ontologies/lbd/entity> <http://data.thomsonreuters.com/1-4295905573> .
<http://www.thomsonreuters.com/ontologies/lbd/entity> <http://data.thomsonreuters.com/1-4296939644> .
<http://www.thomsonreuters.com/ontologies/lbd/entity> <http://data.thomsonreuters.com/1-4297977108> .
<http://www.thomsonreuters.com/ontologies/news/journal> "KKGV" .
<http://www.thomsonreuters.com/ontologies/news/provider> "0147713" .
<http://www.thomsonreuters.com/ontologies/news/source> "Reuters Breakingviews" .
```

- **Metadata:** To improve the utility and connectedness of the Graph Feed, we have included 65 different metadata types in this release. These range from 850 commodities to over 450 currencies, as well as 10,000 industries and 160,000 geographical locations. In some cases, alternative names are available in non-English languages.

Graph Feed (RDF) Example: Metadata

```
<http://data.schemas.financial.thomsonreuters.com/Common/2009-09-01/activeFrom> "1900-01-01T00:00:00" .
<http://data.schemas.financial.thomsonreuters.com/metadata/2009-09-01/commodityId> .
<http://data.schemas.financial.thomsonreuters.com/metadata/2009-09-01/commodityName> <http://data.thomsonreuters.com/2-56ecd640ba71c93b7eb598563e717df1254b24046aa96158acda3c0ae4353401> .
<http://data.schemas.financial.thomsonreuters.com/metadata/2009-09-01/commodityName> <http://data.thomsonreuters.com/2-587509c3b9b736f20cf000043f3ba289cf8b9d7be3760b6072b56c2e0b1783e3> .
<http://data.schemas.financial.thomsonreuters.com/metadata/2009-09-01/commodityName> <http://data.thomsonreuters.com/2-72d3299079f08a3fa5010efae43ce6960beb70b82583f12c9550285e7e9e4ccf> .
<http://data.schemas.financial.thomsonreuters.com/metadata/2009-09-01/commodityName> <http://data.thomsonreuters.com/2-77ccb1841b99de4030ffda4c517281272f8e92b7a9d88c2aab6df8bf8f863def> .
<http://data.schemas.financial.thomsonreuters.com/metadata/2009-09-01/commodityName> <http://data.thomsonreuters.com/2-89ee10062828ee4061bc691fa159c6b0b59d6e0a62446263f84d8d80852d6b0e> .
<http://data.schemas.financial.thomsonreuters.com/metadata/2009-09-01/commodityName> <http://data.thomsonreuters.com/2-9c1c06f2f3a3a665d9ef2ac920c2b0d1bad78ddf3f61291cca97ed3723be848b> .
<http://data.schemas.financial.thomsonreuters.com/metadata/2009-09-01/commodityName> <http://data.thomsonreuters.com/2-b709a554091d72f091aceae2fa719fb9e873bad193879f3e3e7acfe96ec0451e> .
```

For more comprehensive listing of available metadata please consult your Thomson Reuters representative.

Related Thomson Reuters Solutions

Big Open Linked Data Solutions, Thomson Reuters Intelligent Tagging, Data Fusion, Permlid.

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