



Using data analytics and machine learning to assess NATO's information environment

ALLIED COMMAND TRANSFORM

Col Richard Blunt GBR-A, JISR Branch C2DS

Chris Riley, StratCom, Public Diplomacy Division, NATO HQ

Michael Street, Daniel Drabkin, NICA

Marc Richter, Europol (formerly NCIA)

The Information Environment

- Consists of publically available information
 - Mainstream media
 - Social media
 - Specialist reporting e.g. Janes
- NATO's Strategic Communications* operate in this environment
 - Commanders are influenced by the IE

C2 of the IF Strategic Effects Comprehensive Approach Strategic Awareness Political Strategic (DIMEFL) Continuous Information Acquisition and Sharing NATO HQ Consulta · PAI (Licensed Coordination Content) - Journalism - Commercial Military Strategic - IO, NGO, Think NATO Tanks Hybrid Threats Social Media Synchronize Synchronize (Plan Task, Monitor) Assess **IEA Effects** · Diplomatic Reporting **Effects** Strategic Effects Synchronization (NAC/MC) (IS Plans & OPS) (1) Environment Strategic Effects Board Military (DCOS OPI) 2) · Military Reporting Own Capabilities, **Operational** · Intelligence Joint Effects Board (PLANS and OPS function) 2) CC's JFC's Other Reporting Synchroniz (Air, Land, Marit JFC's 8 SOF, Cyber, Log CC's COP (Cognitive, Joint & Component
C2 of Activities Virtual, Physical) Military Tactica

V.1.0

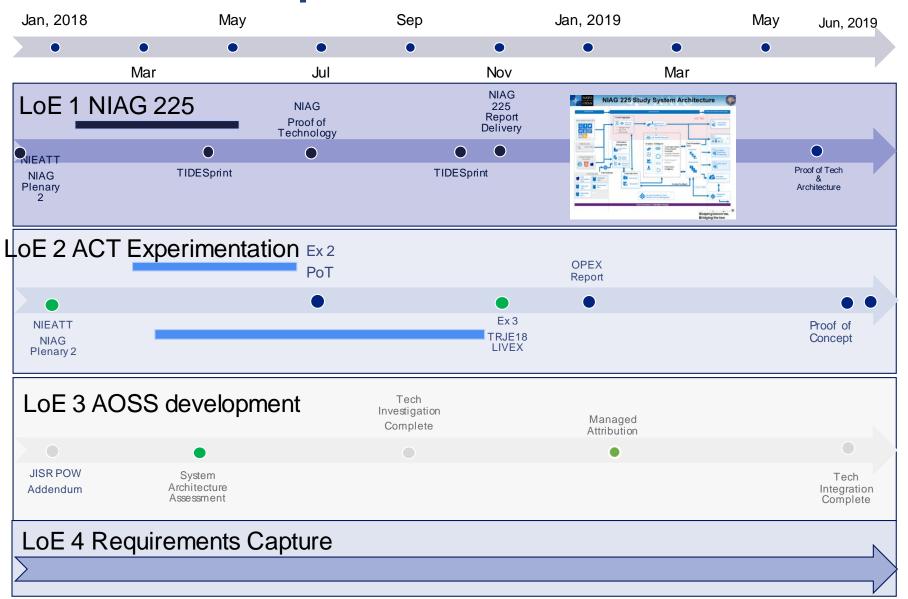
IEA, big data and Al

- The information environment is "big data"
- Assessing it requires complex analysis
- Al / ML can help us understand if/how it is being influenced

IEA Development

- To reach IOC in Jun 2019:
 - LoE 1 NIAG 225 Study "Big Data in support of IEA"
 - LoE 2 OPEX Experimentation including TRJE18
 - LoE 3 Improve existing AOSS
 - LoE 4 Requirements Definition
 - For delivery at IOC (Requirements Set, Proof of Concept, Improved Existing Technology, Proof of Technology, Roadmap to FOC)
- To reach FOC in 2022:
 - Consider recommendations at IOC.
 - Develop wider DOTMLPFI aspects.

Timeline IEA Development



LoE1: NIAG Study Group 225

- Follows on from SG 208: "Adopting big data in NATO"
 - Narrows the focus to a specific use case
- Bringing industry experience, tools and concepts
- Proof of Technology demonstration in June
- Demonstration system by Nov 2018
 - Public cloud hosting

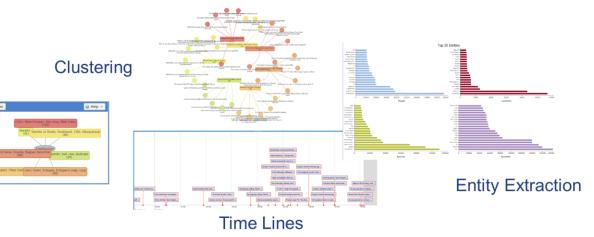
LoE3: ACO Open Source System (AOSS)

Current

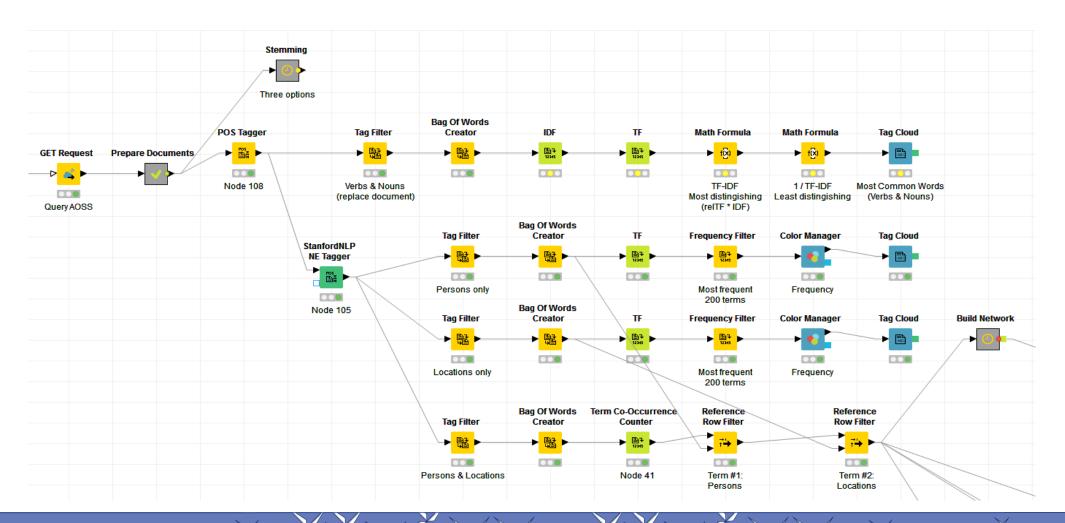
- AOSS is the current tool for OSINT
- Collects information from the internet
- Presents info on NS
- Some analytics capability

Enhancements

- Managed attribution
- Extended data sources
- Multi-lingual support
- Analytics based on PMAR



LoE3: AOSS enhancement KNIME workflows for entity extraction



LoE3: AOSS enhancement Bag of words for Persons and Locations entities

Antonio Guterres
Carter John Richardson Andrew Weiss
Clive Johnstone Johnny Michael Sergei Eduardovich Prikhodko Jimmy Carter
Sergei Eduardovich's 'friend' — Nuland Abrams Robert S. Karem Jean-Claude Juncker
Afghanistan Cornelius Zimmermann Hasanov Zakir Hassanov Richard Kemp James Mattis
Curtis Scaparrotti Juncker Hillary Clinton O'Donnell George W. Bush Zaev Reagan
Jussi Niinistö Javad Zarif Pedersen Erdogan Nicholson Gavin Williamson Thomas Goffus
John Nicholson Philip Breedlove Mikser Zimmermann Deborah Haynes Nastya Rybka Emal
Perincek Bogdan Aurescu Jens Stoltenberg Pavel Barack Obama Mr Zarif Duncan
Scaparrotti Breedlove Nuland Stoltenberg Davidson Obama Vladimir Putin
Snowden Yanukovych Clinton Putin
Talbott Williamson Sven Mikser
Zakir Hasanov Egil Pedersen

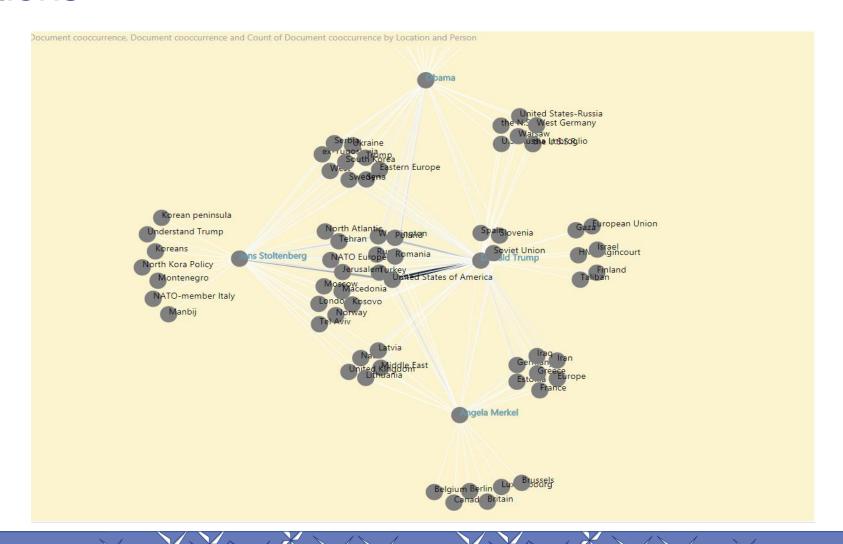
Uzun Angela Merkel Karoblis Donald Trump Merkel Graham Oliker Mr Stoltenberg

Michael Johnson Victoria Nuland Deripaska Kimmage Erhan Uzun Mercier David Carl
Mike Pompeo Johnstone Adm Johnstone MARCOM Kofman Mohammad Radmanish Cheney
Milorad) Dodik Ahmad Sadeq McFaul Donald Tusk Mirza Mohammad Yarmand Cazalet
Mont Verdun Sestanovich Amin Hteit Michael Kofman Bill Clinton Theresa May Peter Zwack
Daniel Fried Nick Larigakis Shortfall Andrea Doria Sutanovac Peter Hultqvist Harry Truman
Dragan Sutanovac Oleg Deripaska Stephen Sestanovich Onet George Cristian Maior
Aleksandar Vulin Fazal Hadi Muslimyar Oleg Voinov Francis Fukuyama Anastasia Vashukevich

Eastern Europe Spain Atlantic Soviet Union Taliban JFC Norfolk Luxembourg Norfolk Nato Netherlands Montenegro Kosovo Baltics Romania Israel Brussels Pakistan Canada Iran Italy Lithuania Turkey Europe Estonia Poland Germany US Britain Moscow United States RussiaUkraine Iraq Sweden Afghanistan Finland Crimea Moldova U.S. Washington Baltic Serbia Azerbaijan Ankara North Atlantic America Belgium France Farah Syria Kaunas Fulda Australia Georgia Mediterranean Belarus Kosovo-Metohija Kiev

12/07/2018

Network graph showing relation between Persons and Locations



12/07/2018

LoE4: Requirements

Sources

RSS Feeds
National Reporting
SM APIs
Data Providers
UN HDX
Other Int Orgs
Academia
NATO Library
TV, Video Media
etc

Data Ingest Framework

Information Services

Entity Extraction

Entity Resolution

Taxonomy

Anomaly Detection

Language

Managed Attribution

Analytics

Stream
Processing
Descriptive
Diagnostic I&W

Batch
Processing
Diagnostic
Predictive
Prescriptive

Machine Learning/Tool Training

Data Egress Framework

Federated Search Service

Integration Service

Data
Visualisation
Dashboards

Geospatially Graphically

Textual Output Forms

Op Reqts

- Data baseline, I&W,
- Audience insights:

Demographics Sentiment

Topics of

interest

Influence

Activism

Motivators

- Disinformation
- MoE NATO Comms:

Friendly

Adversary

System Environment

NU and NS networks

System Environment

Summary







- IEA is one of NATO's first capabilities planned to exploit big data and requiring the use of Al
- It is a team effort from ACT, NHQ, NCIA and industry
- Initial steps are underway to develop IEA IOC, using NATO expertise
- The technology to deliver IEA can be applied to more data sources and be applied to more use cases
- IEA capability will have significant impact across DOTMPLFI