Value of Future Internet capabilities: Multi-domain Big Data Sharing Models

Data & The City.
Amsterdam City Hall
Oct 3rd 2016

Leon Gommans
Science Officer
Air France KLM IT Technology Office - R&D
Guest researcher UvA/SNE
Contexts with potential value to share data

Passenger flow handling

Predictive Maintenance & Scheduling

Cargo load optimization & scheduling

Passenger experience

Cybersecurity (NWO-COMMIT/SARNET project)
Sharing Big Data in a collaborative group of enterprises?
Sharing Big Data assets needs:

- Clearly defined and agreed common benefit
- Established common rules governing use, access, and benefit sharing.
- Organizing trust amongst group members as a means to reduce risk
- Infrastructure supporting implementation of trust
Organizing Trust within a group*

- Rulemaking
- Judicial body
- Group Rules
- Executive
- Administration
- Enforcement

**Business Level**
Governing common value and risk

**IT Level**
Enabling Trusted Access and Use

1. Given an agreed benefit to share data within a group of autonomous organisations:

*How can trusted sharing of big data assets be securely implemented in an infrastructure?*

2. Given future, software definable Internet capabilities provides virtually unlimited amounts of dedicated and secure bandwidth:

*What infrastructure models are best suited to perform big data analyses?*
Traditional Multi-domain Model
Multi-domain in public cloud

Domain A

Domain B

Domain C

Corporate Directive
Encrypted data in public cloud
Analyses on spokes, consolidate at hub
“Turntable model*”, reporting result to hub

Demo at Supercomputing 2005: Seamless Live Migration of Virtual Machines over the MAN/WAN
Sharing using “unlimited” bandwidth.

E.g. a 100 Gb/s link is potentially 20x faster when compared with a local hard disk.
Hub sharing group member data

Domain D

Domain A

Domain B

Domain C

Ana-lyses
Hub sharing group metadata with peering
Securing data access & value exchange

Domain D

Domain A

Domain B

Domain C

blockchain

Ana-
yses
NSF Pacific Research Platform: researching Big Data Sharing infrastructures using 100 Gb/s
SARNET project – Secure Autonomous Response NETworks

SARNET Alliance project: Understanding the creation of an alliance sharing Big Data Assets in cybersecurity context.

SARNET partners

Providing future Internet connectivity with research partners.

Cees de Laat, Tom van Engers, Ameneh Deljoo, Ralph Koning, Paola Grosso (UvA).
Robert Meijer, Frank Fransen (TNO)
Rodney Wilson, Marc Lyonais (Ciena)
Erik Huizer, Gerben van Malenstijn (SURFnet)
Larry Smarr, Tom Defanti (UCSD / PRP project).

Email: leon.gommans-at-klm.com