Federated Cloud approaches to support autonomous data sharing arrangements

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Federated Cloud approaches to support autonomous data sharing arrangements

Business Developer, TNO

Co-chair of Cloud-Edge WG
of the European Alliance for
Industrial Data, Edge and Cloud

Björn Håkansson
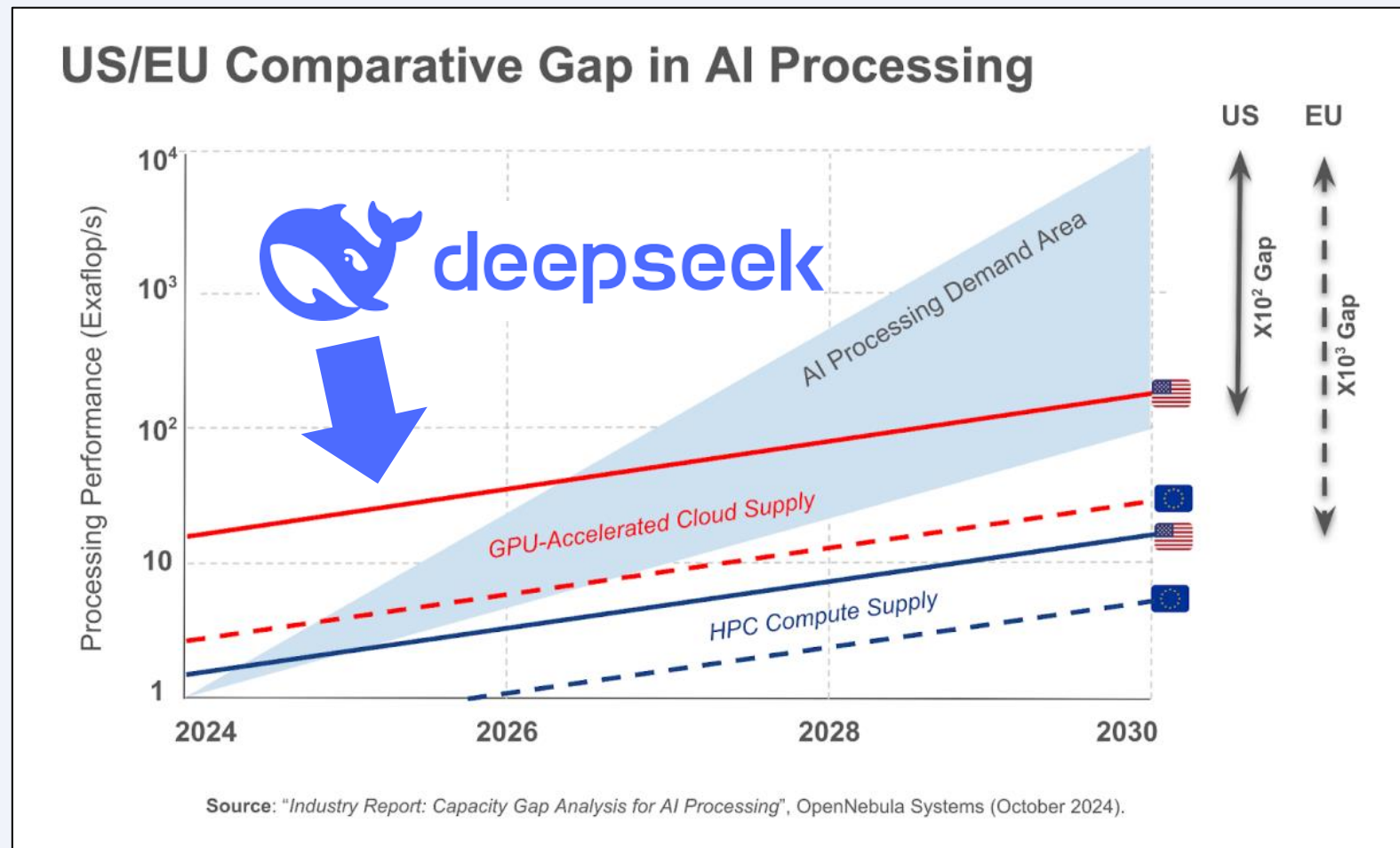TNO

EU and the Draghi report

- The recent report from former ECB president Mario Draghi on The future of European competitiveness has received a lot of attention in media.

- Some of the key points in this report concern digital innovations:

  - "Europe largely missed out on the digital revolution led by the internet and the productivity gains it brought: in fact, the **productivity gap** between the EU and the US is largely explained by the tech sector. The EU is weak in the emerging technologies that will drive future growth."

  - "With the world on the cusp of an AI revolution, Europe cannot afford to remain stuck in the "middle technologies and industries" of the previous century. **We must unlock our innovative potential**."

The future of European competitiveness

Part A | A competitiveness strategy for Europe

S E P T E M B E R 2 0 2 4

"Important Projects of Common Interest (IPCEIs) should be expanded to all forms of innovation that could effectively push Europe to the frontier in strategically important sectors and benefit from EU financing."

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European developments on AI computing vs USA

- Within the domain of Cloud-Edge the need for computing infrastructure for Artificial Intelligence is a hot topic.

- Some of the challenges include dependencies on non-EU players and energy use in AI computing.

- To tackle these challenges several European plans and initiatives are currently being developed, such as new IPCEI projects.

US/EU Comparative Gap in AI Processing

Source: "Industry Report: Capacity Gap Analysis for AI Processing", OpenNebula Systems (October 2024).

An industry report from OpenNebula highlights the developments in AI processing.

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The new European Commission 2024 - 2029

- EVP Henna Virkkunen was assigned Tech Sovereignty, Security and Democracy with a.o. these tasks in her mission letter:

  - Boost **Artificial Intelligence innovation**, ensure access to the **AI Factories**. Develop an AI strategy and set up European AI Research Council.

  - Intensify efforts and investments concerning the next wave of frontier technologies.

  - Develop and **EU Cloud and AI Development Act** to increase computational capacity and develop a single **EU-wide cloud policy** for public administrations and public procurement.

  - Present a **European Data Union Strategy** to ensure a simplified, clear and coherent legal framework for business and administrations to share data seamlessly and at scale.

  - Etc.

We must exploit our strengths in order to maintain or attain leadership in strategic technologies, to establish essential assets for technological sovereignty and resilience, and to foster commercialisation of deep tech innovation.

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Cloud is a hot topic – both in Europe, and nationally in NL

Commission approves up to €1.2 billion support by 7 Member States for an IPCEI on Next Generation Cloud Infrastructure and Services (IPCEI CIS)

€2.6bn for IPCEI projects on European cloud technologies

Technology News | December 5, 2023

Goedkeuring voor €70 miljoen kabinetssteun aan Nederlandse cloudinnovaties

-12-2023 | 20:00

nderd ondernemingen en kennisinstellingen uit
nden gaan samenwerken aan het opzetten van
novatieve cloudoplossingen voor (industriële)
t moet leiden tot minder technologische
eden en minder marktverstoring. Maar ook tot ee
baarheid en onderlinge deelbaarheid van data
k de concurrentiepositie van Nederlandse
betert. De Europese Commissie heeft vandaag
initiatieven

Dutch iT Channel

Info Support, i3D.net, BIT, AMS-IX en TNO bouwen federatieve Europese cloud

Een Nederlands consortium, bestaande uit Info Support, i3D.net, BIT, AMS-IX en TNO, start met het bouwen van een federatieve Europese cloud. Het project "European cloud services in an open federated ecosystem" (ECOFED) wordt mede gefinancierd door de Nederlandse overheid, na goedkeuring van de Europese Commissie.

Cloud   Infrastructuur

HOME / TOO LATE TO ACT? EUROPE'S QUEST FOR CLOUD SOVEREIGNTY

POLICY BRIEFS   1 MARCH 2024

Too late to act? Europe's quest for cloud sovereignty

By *Alexandre Ferreira Gomes, Maaike Okano-Heijmans*

digitaal / nieuws

Rijk heeft geen grip op cloudgebruik

Uit onderzoek van de Algemene Rekenkamer blijkt dat het rijk overzicht mist over het gebruik va

Marjolein van Trigt 15 januari 2025

Plenair debat

Debat over het rapport van de Algemene Rekenkamer 'Het Rijk in de cloud'

De vergadering **moet nog plaatsvinden**

Bekijk dagoverzicht

Zaal: Plenaire zaal

Te behandelen zaken

1   Rapport Het Rijk in de cloud; Donkere
pakken samen

26643-1264 Brief regering d.d. 15
2025 - P.J. Duisenberg, president
Algemene Rekenkamer Rapport
in de cloud; Donkere wolken pak
samen

Tweede Kamer
DER STATEN-GENERAAL

2 jan 06:00

Kan Lidl het Amerikaanse monopolie in de cloud doorbreken?

sper Houtman, Jan Fred van Wijnen

gse oppositie spreekt van het 'Microsoft-infuus': de
lijkheid van grootschalige computercapaciteit uit de
. Ma...

AI expert on €1.5 billion for European AI factories: 'Not enough to compete with US'

The Eu
But if w

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NEWS > TECHNOLOGY

Trump's $500B AI plan is 'slap' in the face for Europe

Massive U.S. investments in artificial intelligence leave EU ambitions in the dust.

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Federated cloud infrastructures to support data sharing

Data Sharing and AI needs to be supported by capable cloud services providers, but two key questions emerge;

Are cloud federations a solution for European cloud providers to scale up capacity in order to better compete with non-EU hyperscalers?

Are cloud federations a solution for European cloud providers to offer more digital open strategic autonomy to governments and other users?

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Cloud Federation made available in different shapes

- Cloud Federation is a term being used in many places, but we often see different interpretations on what a federation means in this context. These are some of the federation models you can come across:
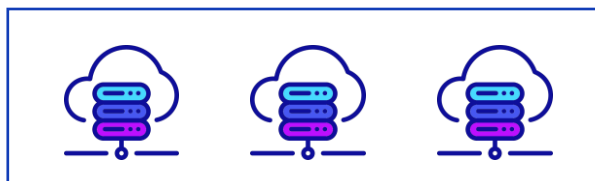
Commercial Federation
Cloud Service Providers federated in a common catalogue e.g. with federated billing in a one-stop shop.

Compliancy Federation
Cloud Service Providers federated based on a common compliancy, without need for interoperability.

Trust Federation
Cloud Service Providers federated based on a labelled trust framework where certain compliancy is verified.

Service Federation
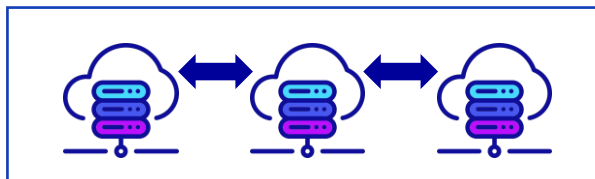Cloud Service Providers federated in a 'provider mesh', a shopping mall model offering service compositions.

Resource Federation
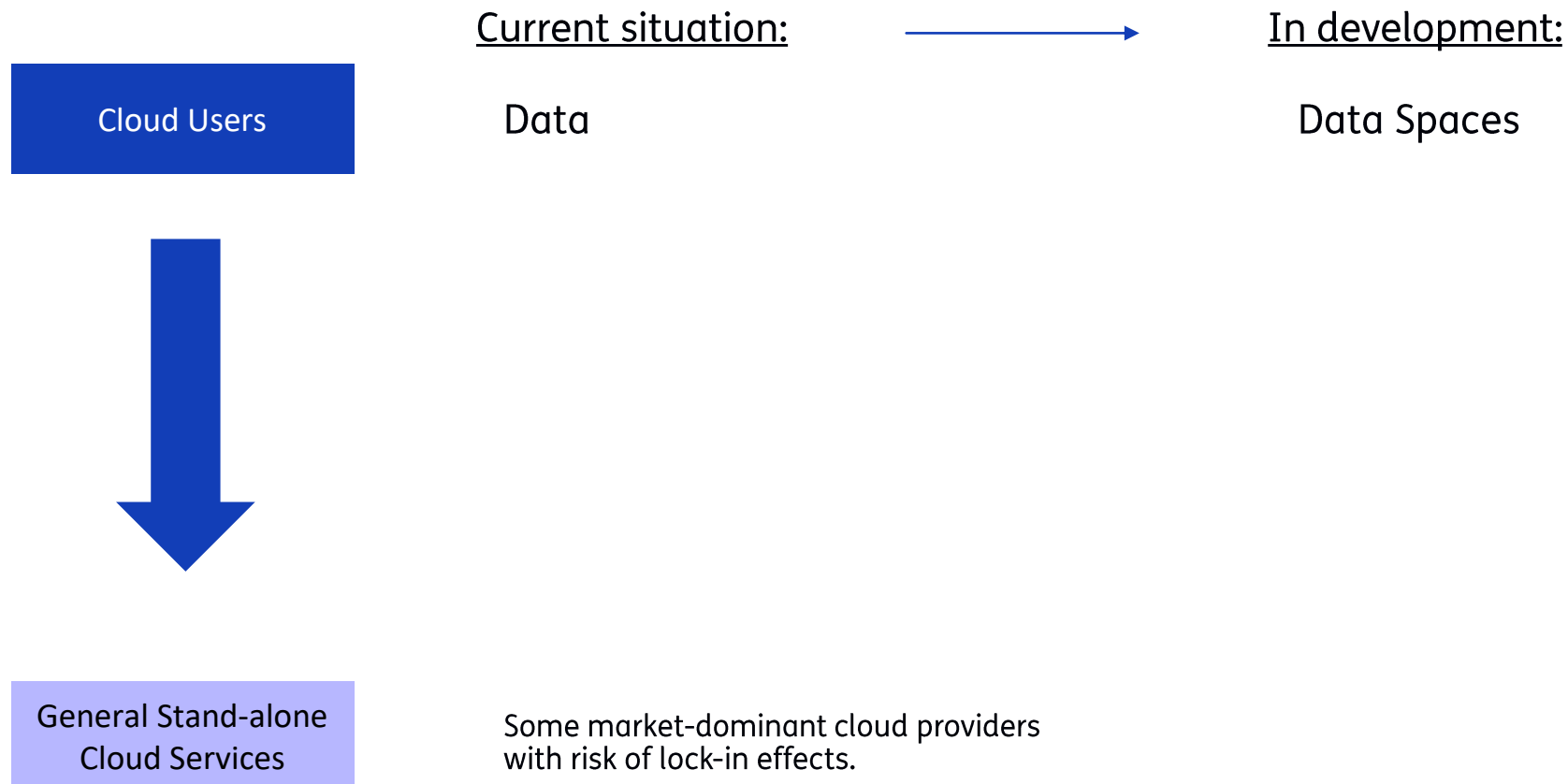Federated Cloud Service Providers offering resource expansion and/or cloud roaming across a continuum.

Trusted Resource Federation
Federated Cloud Service Providers offering resource expansion and/or cloud roaming across a continuum.

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Cloud Federation on different levels

- Cloud Federation is just one component in this new emerging more open cloud landscape, where cloud providers are developing complementary and interoperable services, based on open standards :

<u>Current situation:</u>   <u>In development:</u>

| Cloud Users |

Data   Data Spaces

| General Stand-alone Cloud Services |

Some market-dominant cloud providers with risk of lock-in effects.

Cloud Federation on different levels

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Data Data Spaces

Catalogues / Marketplaces		

Well known
cloud providers

General Stand-alone Cloud Services		

Some market-dominant cloud providers
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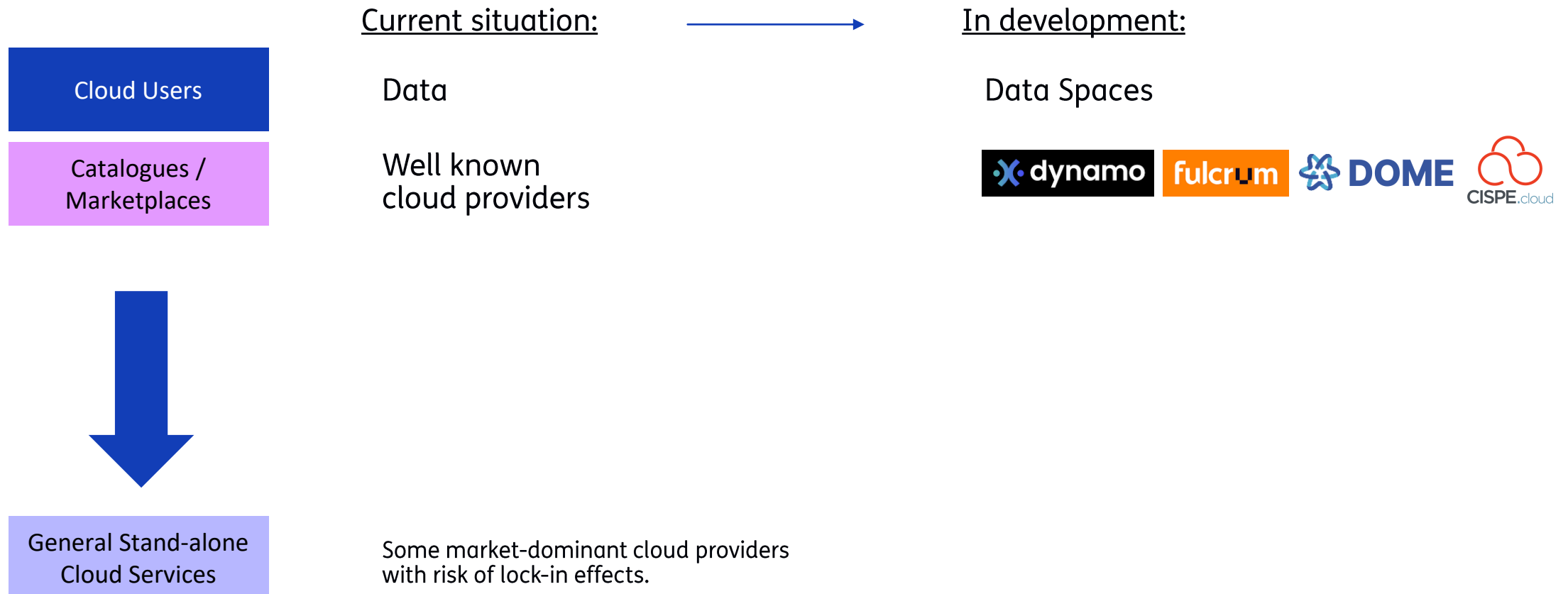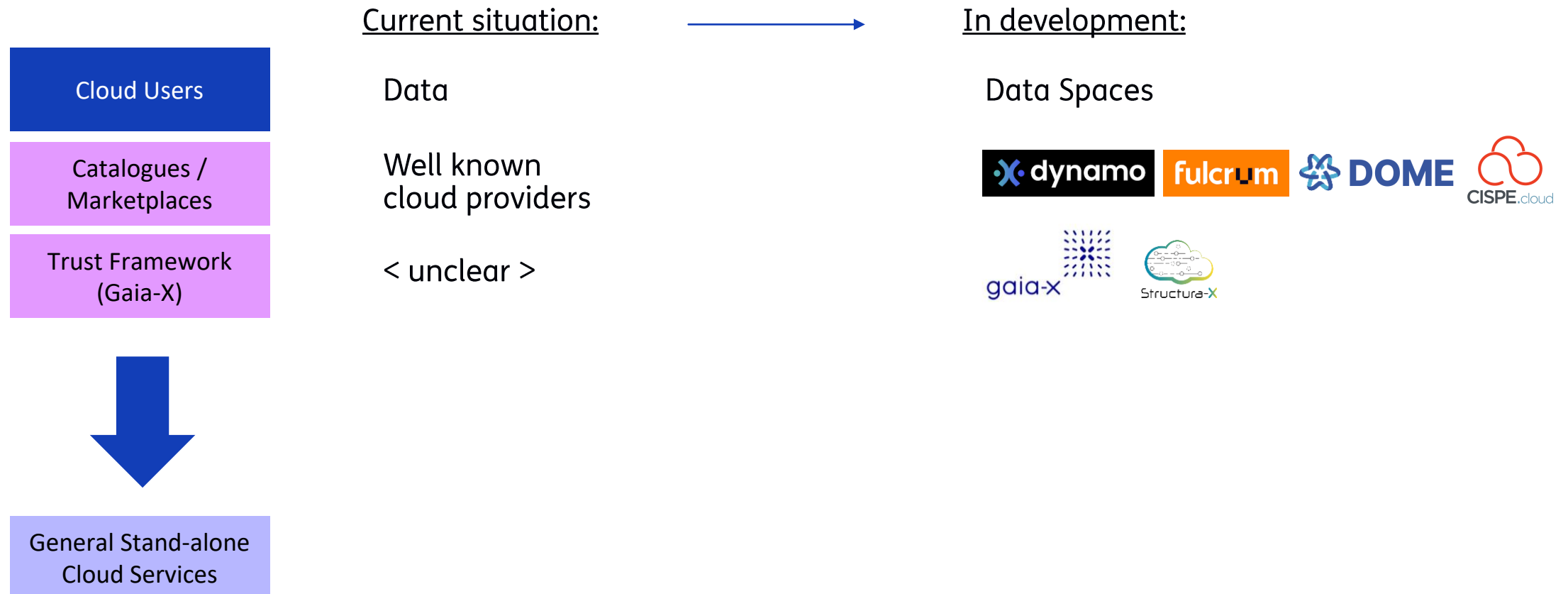**TNO** innovation
for life

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| Trust Framework (Gaia-X) |

Data

Well known
cloud providers

< unclear >

Data Spaces
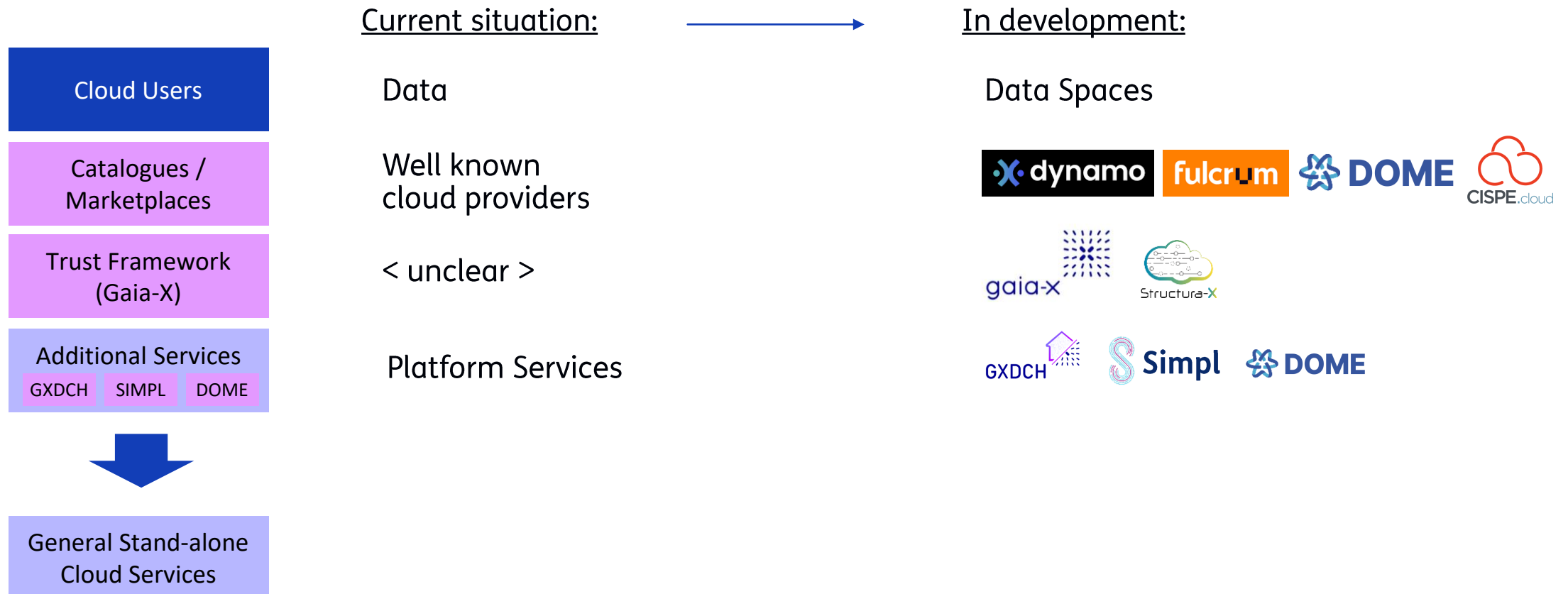
General Stand-alone
Cloud Services

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Additional Services GXDCH SIMPL DOME	Platform Services	

⬇

General Stand-alone Cloud Services
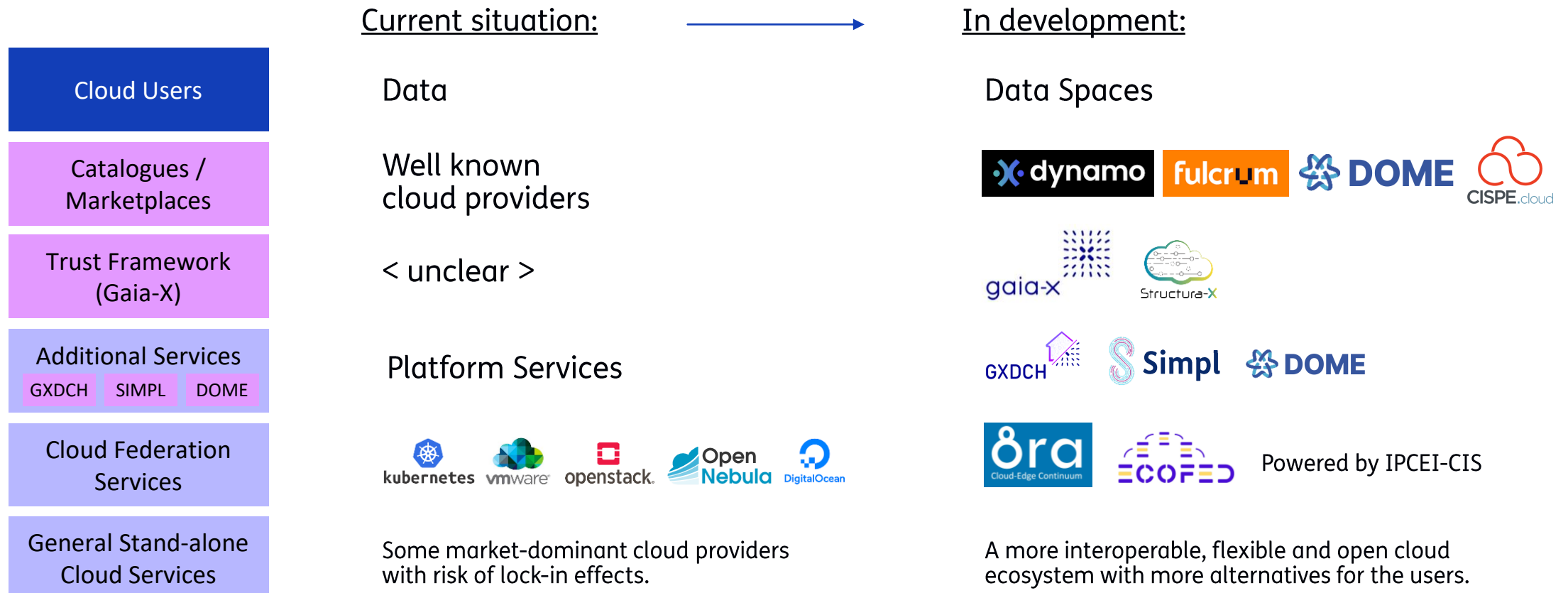

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| Additional Services GXDCH SIMPL DOME | Platform Services |

| Cloud Federation Services |

| General Stand-alone Cloud Services |

Powered by IPCEI-CIS

Some market-dominant cloud providers with risk of lock-in effects.

A more interoperable, flexible and open cloud ecosystem with more alternatives for the users.

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Which initiatives are relevant in the short term?

- Catalogues, new marketplaces and other market-oriented cloud federation initiatives are relevant for the cloud market in the short term.

- Some platform and middleware services are also available in short term

- Initiatives like these could be relevant for PoCs, Pilots or Commercialization and could be interesting to support autonomous Data Sharing arrangements in the short term.

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Learn more about Federated Cloud approaches to support autonomous data sharing arrangements

13:45   **Interactive Breakout Sessions & Workshops**

Federated Cloud solutions to support Data Sharing arrangements

Björn Hakansson

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Francesco Bonfiglio

·X· dynamo