

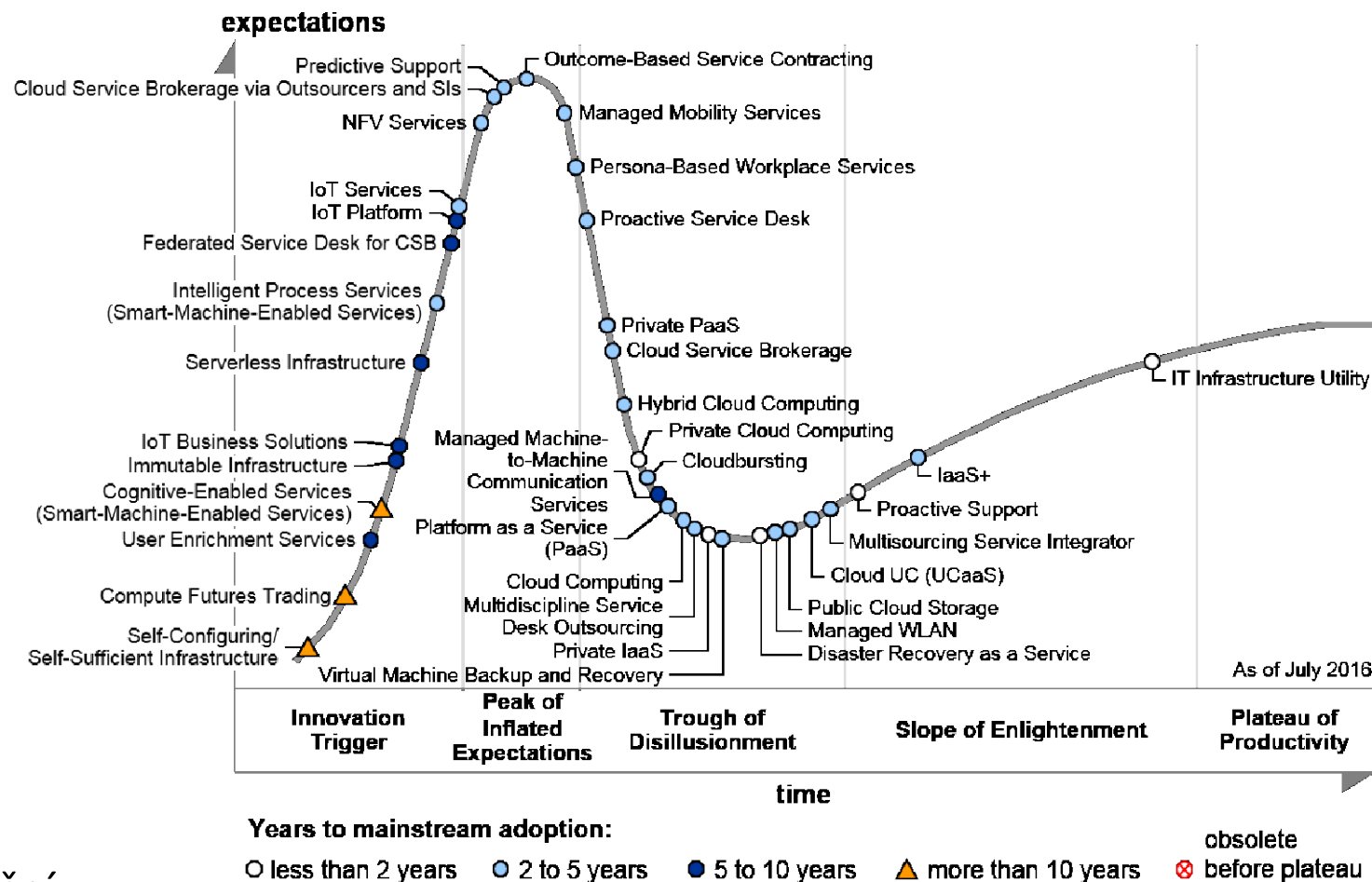
Cloudové služby - Geant IaaS Framework



Klub ředitelů – Ústí nad Labem – 27. 4. 2017
R. Iglar

Východiská

- EU Digital Single Market
- European open science cloud
- Požadavky uživatelů
 - Škálovatelnost
 - Jednoduché UI
- Plánování
 - Interní strategie – horizont X let
 - CAPEX vs. OPEX, ale zároveň mnohem komplexnější
- Infrastruktura
 - Způsob práce, aplikace...
- Komplexnost – právní, finanční, licenční
- Dostupnost / nedostupnost služeb (např. Google výpadek)
- Bezpečnost
- Agregace poptávky -> silnější vyjednávací pozice



Přístup GÉANT

- Hybridní přístup:
 - Buy – IaaS tender
 - Make – on-premise, sdílení zdrojů (metacentrum)
- Agregace poptávky -> silnější vyjednávací pozice
 - Nabídka x Poptávka
- Specifické právní, procesní, technické požadavky

... a vzájemné propojení.



Vlastní obchodní podmínky, Výběrové řízení,
Smluvně-dodavatelské modely



Federativní přístup,
Reporting, Billing



L2 / L3 peering, Bezpečnost uchování
dat, Data retention

Geant IaaS Framework

- IaaS procurement

- Pan-evropský tender
- 36 zapojených NREN
- EC Procurement Directive (2014/24/EU)



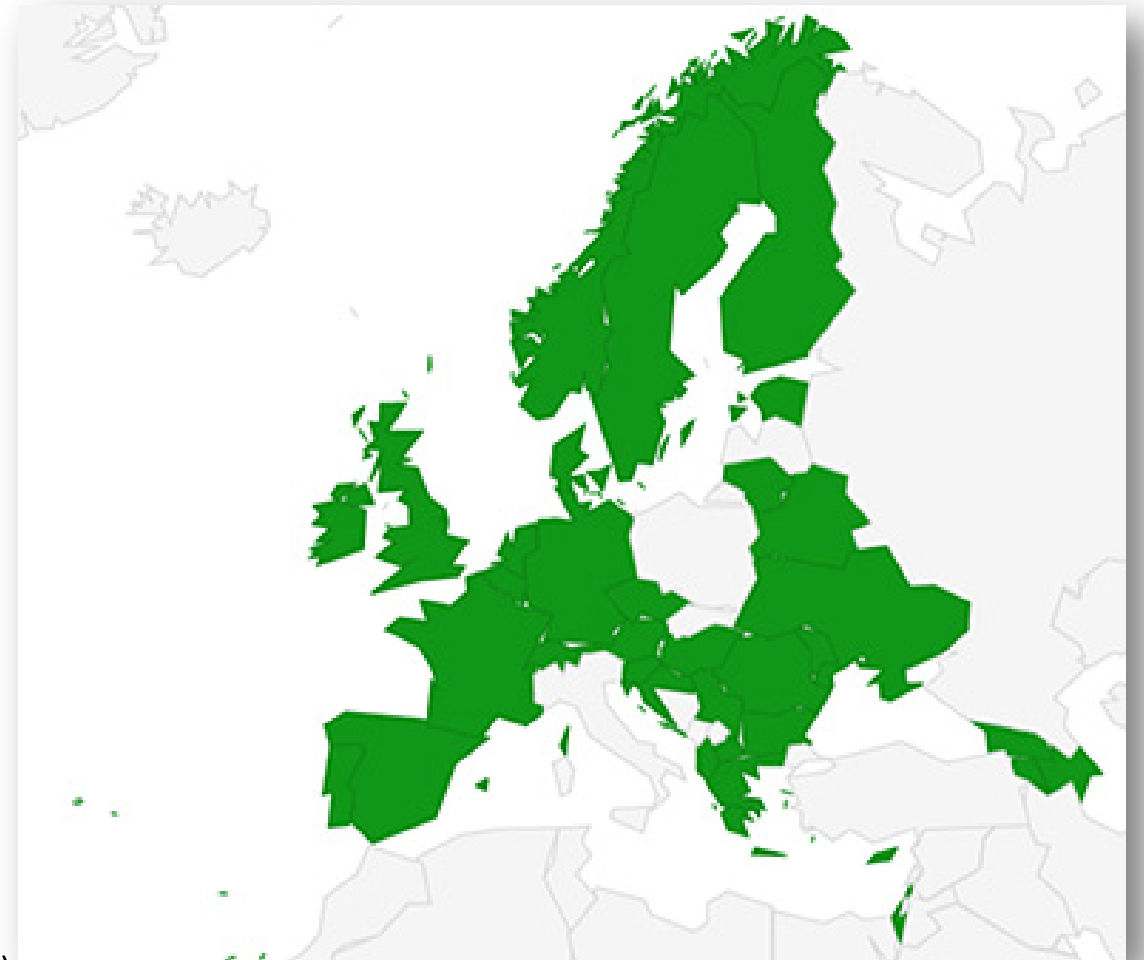
*Framework Agreement use
Cross-border procurements
Centralised Purchasing Bodies*

- Uživatelé:

- Členské organizace
- ..i další organizace ve vztahu k NREN a pro potřeby Research & Education

- Výsledek:

- **Vysoutěžené Rámcové smlouvy (4 roky)**
- **12 řešení (23 poskytovatelů)**
 - 3 Amazon
 - 10 Microsoft
 - 10 OIP
- Možnost specifikovat vlastní požadavky
- Aktivní, nebo pasivní zapojení NREN
 - x % na pokrytí nákladů (právní podpora, marketing, akce..)
 - White-labelling



- Přidaná hodnota

- úspora:

- tender discounts (0-20 %)
 - volume discount (podle objemu skrze celý GÉANT: 10.000 institucí)
 - Další Pre-purchase slevy
 - Sleva z egress poplatků

- SAML2 a eduGain interfederace

- Network peering (L3 peering, ale i L2 do datových center)

- Vlastní smluvní podmínky (mini-tender)

- Invoice billing, Není potřeba kreditní karta

- Pre-purchase -> predikovatelnost cen

- BYOL

- EU/EUA legislativní compliance

- EU Data Protection Law

- Osobní údaje, Tajné údaje, Vojenský výzkum

Adoption and service support.
Strategic collaboration.

Network: No data traffic charges.
Connect to GÉANT and NRENs networks over public IP.
Direct connect to institutions, Layer 2 point-to-point connections.

Exit support.
Data portability.

Identity Management:
SAML2 and eduGAIN

Compliance with EU Data Security Directives.
Ability to offer IaaS from inside the EC / EEA.

General security policies and processes.
Handling of sensitive data (including public health or military research).

Admin management portal.
Customer self service portal.
Order placement, reporting and group management.

Volume discount (initial discount and additional tiered discounted pricing). No price increase.
Purchase order and post-paid billing.
Recognising aggregated spending, combined for all participating institutions.
Accommodating capital expenditure (upfront commitment).

Mechanisms to reduce costs for underutilised (or paused) cloud resources.
Support for Bring Your Own License (use existing educational licenses).
Migration of existing contracts.

API support.

Výsledek tendru – Microsoft & Amazon

Company	Company home base(for framework)																																		
		Albania	Armenia	Austria	Belarus	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Georgia	Germany	Greece	Hungary	Ireland	Israel	Lithuania	Luxembourg	Macedonia	Malta	Moldova	Netherlands	Norway	Portugal	Romania	Serbia	Slovenia	Spain	Sweden	Switzerland	Ukraine
Microsoft Azure (11):																																			
Atea	Latvia/Nordics		x	x			x	x	x	x	x	x		x	x	x	x		x	x		x	x	x	x					x	x	x		x	
CACTUS	Kosovo	x																				x													
Comparex (also AWS)	UK?	x	x	x	x	x		x	x		x	x		x		x	x			x				x	x	x	x	x	x	x	x	x	x	x	
Dom-Daniel LLC	Armenia		x																																
Infsoft Systems	Albania	x		x		x	x	x			x		x	x	x	x			x	x		x	x	x				x	x	x			x	x	
Micromail	Ireland	x	x	x	x	x		x	x		x	x	x	x	x	x	x	x	x		x	x	x							x		x	x	x	
Nextsense	Macedonia																								x										
Novabase	Portugal																										x								
SoftwareONE UK	UK		x	x				x	x		x	x		x		x	x							x	x						x	x	x		x
Span	Croatia						x																												
Ymens Teamnet	Romania																																		
Amazon AWS resellers:																																			
Acrus Global	UK		x	x					x		x	x		x		x									x	x	x			x	x	x		x	
Comparex	UK?	x	x	x	x	x		x	x		x	x		x		x	x			x	x			x	x	x	x	x	x	x	x	x	x	x	x
Telecom Italia (also OIP and AWS)	Italy?																																		

Výsledky tendru - ČR



Company	Company home base(for framework)	
Microsoft Azure (11):		
Atea	Latvia/Nordics	x
Comparex (also AWS)	UK?	x
Micromail	Ireland	x
SoftwareONE UK	UK	x
Amazon AWS resellers:		
Comparex	UK	x
Telecom Italia (also OIP and AWS)	Italy	x

Czech Republic

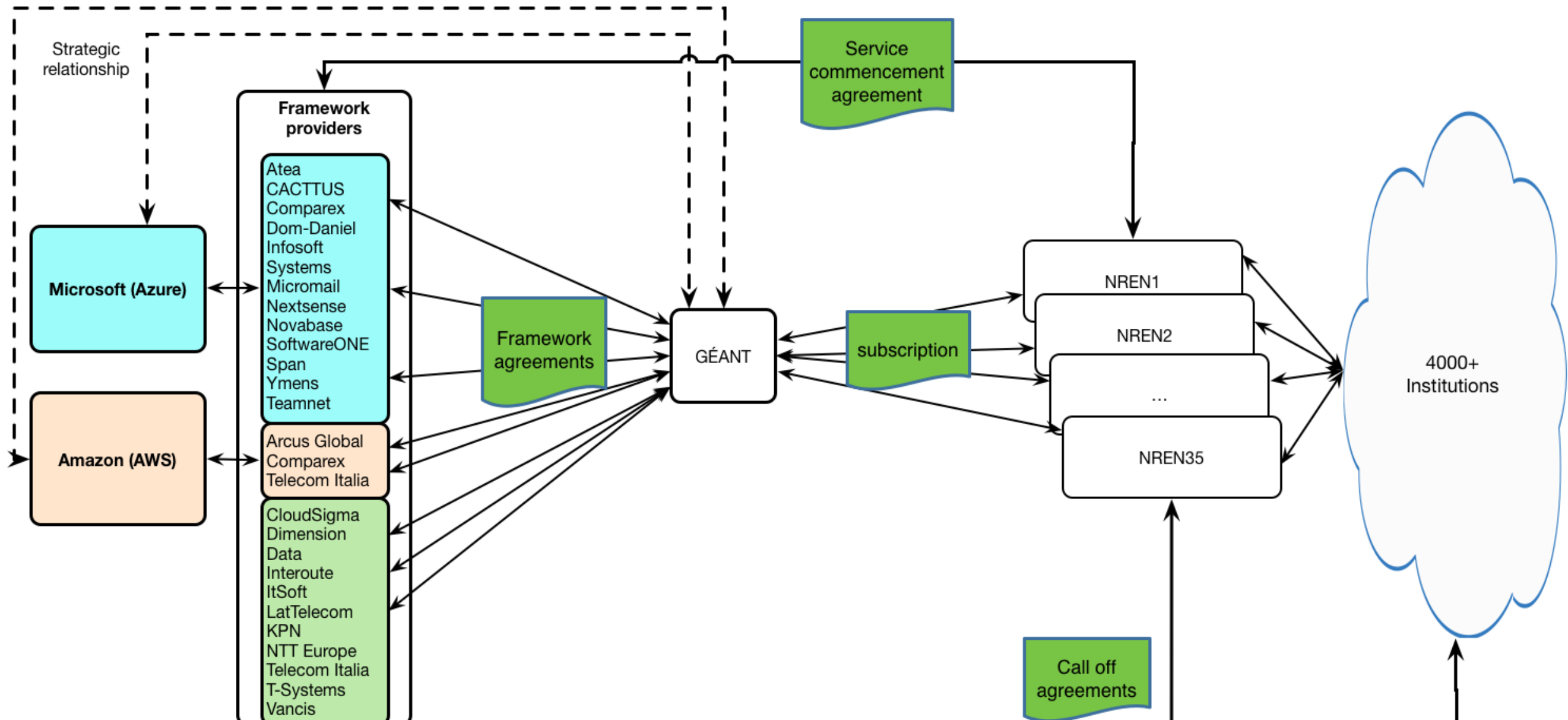
Company	Company home base(for framework)	
OIPs		
CloudSigma	Switzerland	x
Dimension Data	Dutch office	x
Interoute Communications	UK	x
NTT Europe	UK	x

Czech Republic



TELECOM ITALIA GROUP

Delivery supply chain



Čerpání služeb

Varianta 1

Direct award

*základní obchodní podmínky nastaveny v
rámcové smlouvě*

- Žádná „customizace“

Výběr dodavatele – možnost vlastního scoring

Není nutnost specifikovat výběr dodavatele

Podepsání Call-off agreementu

Čerpání služeb

Varianta 2

Mini competition

*vlastní požadavky, add-ons
Např. technické, organizační, právní,
bezpečnostní*

Další podmínky a specifikace požadavků
v oblastech definovaných tendrem

Evaluace (nutnost specifikovat)

Výběr dodavatele

Úprava Call-off agreementu

Čerpání služeb

NREN Role

- **Referrer**

NREN understanding and consolidating the needs of the sector, negotiating appropriate terms and conditions with vendor, conducting appropriate levels of due diligence to improve the value of the product for the sector. The vendor makes the improved proposition to the sector and NREN is paid a referral fee. The NREN does not sit in the contracting line.

- **Reseller**

In addition to the above, NREN acts as an aggregation point in the HE sector, aggregating demand, and providing scale efficiencies. NREN takes the reseller income at a responsible level with benefits for both the sector and the NREN. NREN sits in the contracting line.

- **Underwriter**

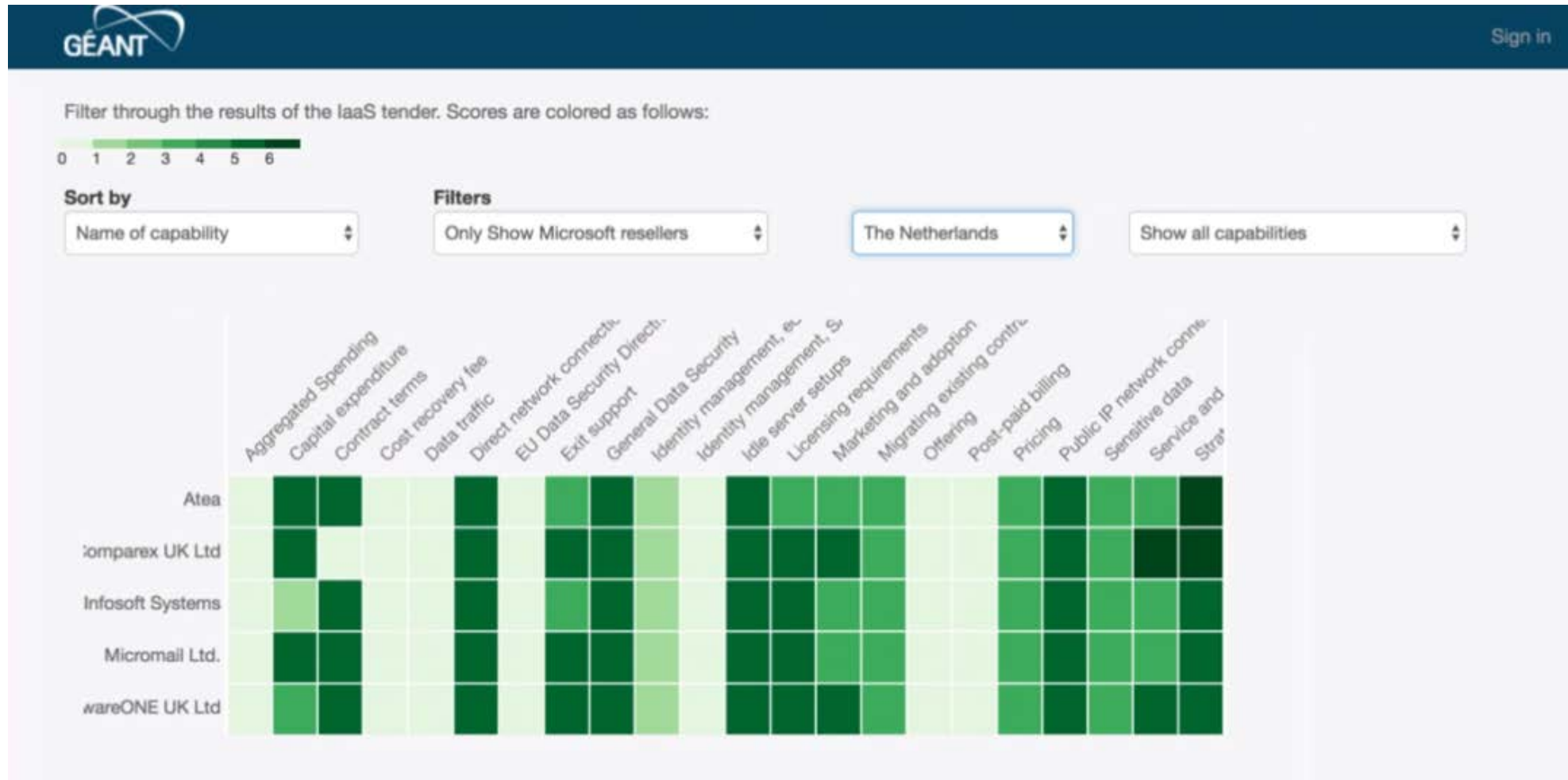
In addition to the referrer job, NREN commits to a level of purchase on behalf of the sector and achieves better pricing and a revenue share. The risk lies with NREN to meet the difference between the commitment and the actual purchase. NREN does not sit in the contracting line and is not seen as the supplier – but users get the services “for free”.

Role NREN ?

- Reseller / Refferer
- Legislativní podpora
- Marketing podpora
 - Workshop: Vendor – meeting
 - Komunikační kanály
 - Pracovní skupina ?
- Technická podpora ?
 - Migrační support
 - Licenční support
 - Risk assesmenty

IaaS service matrix

<https://catalogue.geant.org/reports/>



NTT Europe

General Data Security



Evaluation by tender review committee

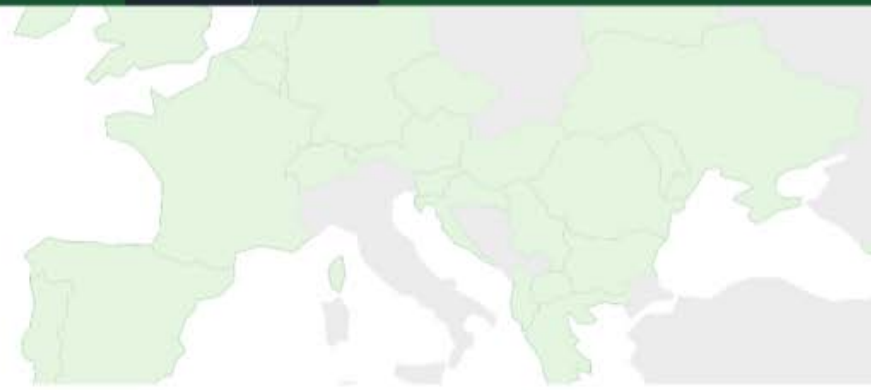
Score: 6

Review comment: Response provides a clear and comprehensive solution to GEANT's requirements and brings significant added value and benefit, which is supported by evidence: Tenderer provides a very comprehensive security management system, which includes BC or DR optional solutions for customers.

[more details](#)

SoftwareONE

com Italia (AWS)



AC8 – General Data Security (Awarding Criteria)

R. Providers need to ensure secure, reliable and a legally compliant treatment of customer's data.

Q. Please describe in detail the policies and processes to ensure data security and data privacy in relation to the proposed services.

Response Guidance

- *Describe mechanisms to protect data at rest and in transit. *
- *Describe how customer data transiting networks (Internet, inside your network, connection to 3rd parties) is protected against tampering and eavesdropping (e.g. network protection, use of*

Peering

- Cloudové služby = kvalitní jen tak jak kvalitní síť
- Peering
 - L3 – IP BGP peering
 - L2 – Microsoft Express Route, AWS direct connect
- Místa peeringu
 - Geant PoP
 - NREN direct
 - IX (AMX-IX, VIX)
- Služby
 - Geant VRF
 - Vlastní (interní) adresace
 - Anycast routing

	Internet	Agreed
	Exchange	GÉANT
	Public	L3 Peering
	Peering	Locations
Cloud provider		
Cloudsigma	Zurich Frankfurt	Zurich Frankfurt planned
Dimension data	Dublin London Amsterdam Frankfurt	In discussion
Interoute	Amsterdam Stockholm London Frankfurt munich	In discussion
Microsoft	Dublin London Amsterdam Frankfurt	Dublin, London, Vienna
Amazon	Dublin London Amsterdam Frankfurt	In discussion



15 % sleva na egress poplatky
pro R&E komunitu.

AWS Government, Education, & Nonprofits Blog

AWS Offers Data Egress Discount to Researchers

on 01 MAR 2016 | in [Education](#) | [Permalink](#)

AWS Makes Cloud and HPC Budgeting More Predictable for Scientists

The pace of research is no longer limited by the availability of computing resources. Researchers are beginning to rely on cloud computing to drive breakthrough science at breakneck speeds and AWS wants to fuel the pace of new discoveries by making it possible for all scientists to have their very own supercomputers in the cloud.

Today, AWS committed to making it easier for scientists to use its cloud storage, computing, and database services by waiving data egress fees for qualified researchers and academic customers; these are fees associated with “data transfer out from AWS to the Internet.” The maximum discount is 15% of total monthly spending on AWS services, which is several times the usage we typically see among our research customers. However, there is no cost to upload data into AWS, or move data between [Amazon Simple Storage Service \(Amazon S3\)](#) and [Amazon Elastic Compute Cloud \(Amazon EC2\)](#).

The agreement has been supported through ongoing discussions with Jisc in the UK, GÉANT in Europe, and DLT in the United States, which provide network infrastructure and supporting cloud services to education and research institutions around the world.

“Having predictability and stability in costs is one of the major challenges for researchers in adopting cloud services, so it’s welcome news that AWS is removing egress charges for academic customers. There’s a real opportunity here for cloud computing to become as ubiquitous to research as it is in the commercial market, and with it bring a massive boon to the sector, supporting more efficient, collaborative and innovative research outputs,” said Dan Perry, director of product and marketing at Jisc.

Professor Tony Hey, chief data scientist for the Science & Technology Facilities Council (STFC), said, “I am delighted that AWS is taking this step to remove uncertainty about egress charging for research use of their cloud infrastructure, following extensive discussions with Jisc and GÉANT. I often hear from researchers that the perception that they will receive large bills for data downloads has discouraged them from considering commercial cloud providers for their compute and data requirements. The cloud has a huge amount to offer in terms of agility and efficiency gains, and also unique capabilities in areas such as machine learning. This is a very welcome development from AWS, and I hope that other cloud providers will move swiftly to follow suit.”

By reducing data egress fees, AWS will help scientists launch their first computing machine in minutes, analyze data pipelines, and store petabytes of data in the cloud, ultimately accelerating time-to-science.



Azure egress fee waiver for the academic community

Posted on Monday, May 2, 2016



 [Brian Hillger](#), Senior Director, C+E Business Planning

Based on Microsoft's extensive experience engaging and working with the academic community, we strongly believe educational institutions of all types and sizes can benefit from cloud services, for research as well as for teaching and learning environments. Microsoft also understands the need for academia to better manage costs when transitioning from traditional licensing to a consumption-based model, and we are always looking for ways to make the transition to the cloud easier for the community.

Academic customers constantly worry about unknown costs and their liability under variable financial structures. One of the concerns we hear most often, is the cost of data egress fees. In order to enable our educational customers to achieve even more with the cloud, we are excited to announce an **Internet egress fee waiver** for qualified customers¹ North America, Europe and APAC. This makes moving to the cloud a much more predictable expense. Even more importantly, it paves the way for researchers to accelerate the pace of the important work they're doing.

Microsoft partnerships: In addition to reducing the cost of moving to the cloud, Microsoft is working with key National Research and Education Network partners such as Internet² in the US, and Géant in Europe, to allow data to flow from our cloud services to our academic customers across this new connection, and to further strengthen our network. We have been working closely with these organizations along with Jisc in the UK, SURFnet in the Netherlands and HEAnet in Ireland to provide a superior cloud experience for our customers.

15 nebo 69,2 %
sleva na egress poplatky pro
R&E komunitu



Microsoft ExpressRoute

Dedikované L2 propojení mezi institucí a Microsoft cloud
(Azure, Office 365)

Požadavky komunity

- Bezpečnost
- Garantovaná bandwidth
- Vlastní adresování v rámci Microsoft cloud
- Cena (no ingress, egress slevy)

Modely

- A: 15 % sleva z měsíčního egress poplatku
- B: 69,2% sleva
 - Unlimited - podle bandwidth – no egress
 - Metered – fixní PORT/cena + egress per GB

Dohoda GÉANT – Microsoft umožňuje NREN nabídnout organizacím, predikovatelná cena

Propojení:

- Amsterdam (NetherLight)
- Londýn (GÉANT Open)

10 Gbps

GÉANT první nekomerční entita s dohodnou s Microsoftem

SAML & eduGAIN

- SAML/eduGAIN interfederace
- Nutnost implementovat do 6 měsíců od podepsání kontraktu
- Many vendors understand the concepts but need help from GEANT
- Contractual requirement, pragmatic acceptance
- Implementation Details
 - 10 Cloud Vendors committed to SAML + eduGAIN
 - Microsoft Azure– SAML + závazek eduGAIN do 12 měsíců
 - Amazon AWS – SAML
 - Poskytovatelé pracují na implementaci
 - Pro „SAML only“ poskytovatele nutná konfigurace na straně NREN-Instituce



Případy užití

- Peering a interfederace
- Stávající služby lze převést pod kontrakt (se slevou)
 - Výuka studentů
 - Vstupní budget (pro testování apod.)
 - Dočasná náhrada vlastní infrastruktury (při migraci, obnově apod.)
- Hot stand-by
 - nárazový výkon rychlá škálovatelnost -> platba jen za využití CPU, RAM, HDD
- Cold-stand-by
 - v případě výpadku vlastní infrastruktury - > rychlá obnova
 - ? Záložní datové centrum ?
- VFN
 - zbavení se starosti o HW
 - nedostatek technického personálu, a jeho vzdělávání
 - CAPEX vs. OPEX
- CERMAT
 - front-end webové servery (nárazový výkon)
 - bezpečnost vůči DDoS útokům

Diskuse

- Zájem o využití / služby
- Způsoby využití
- Role CESNET
- Podpora CESNET