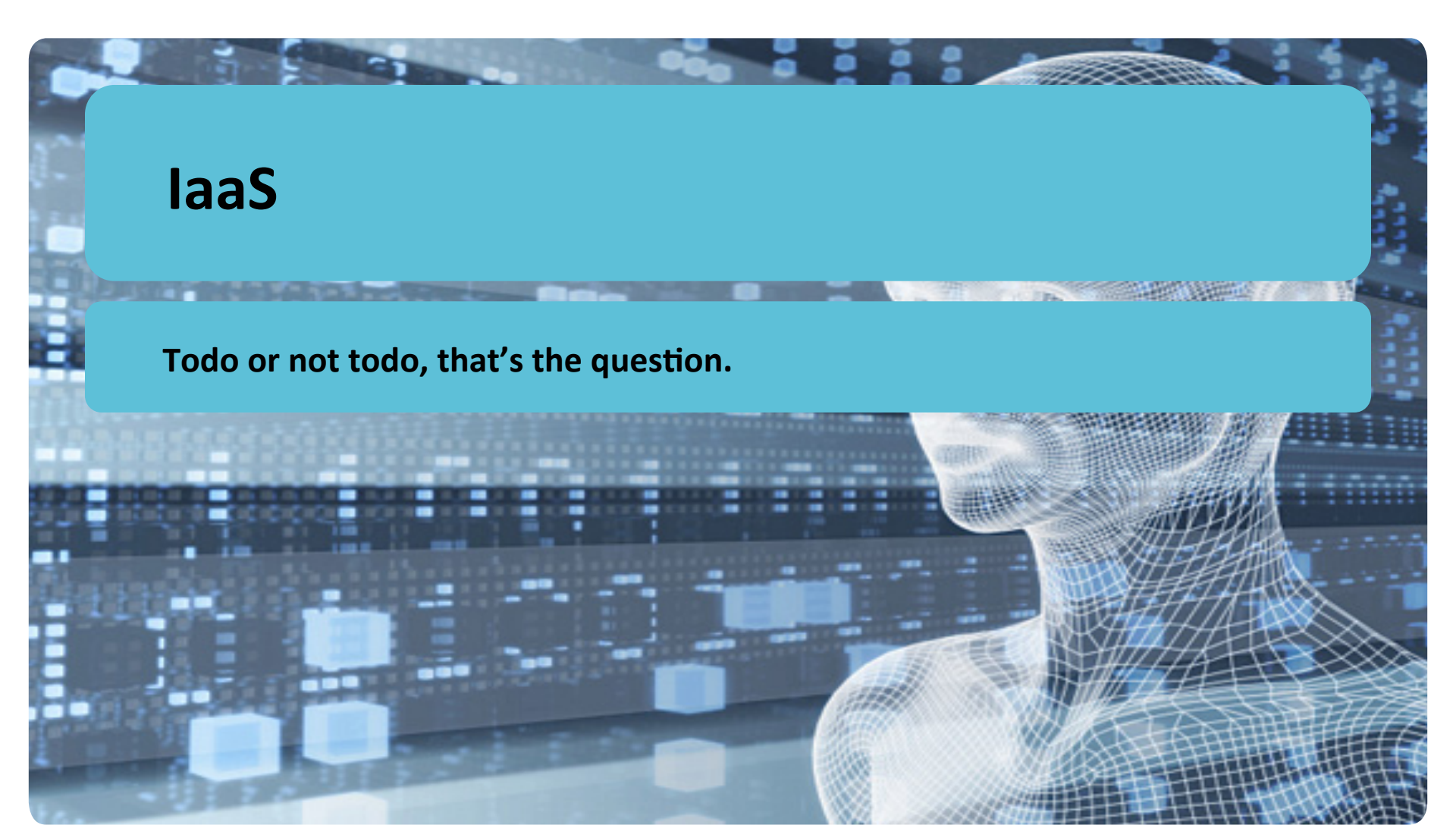




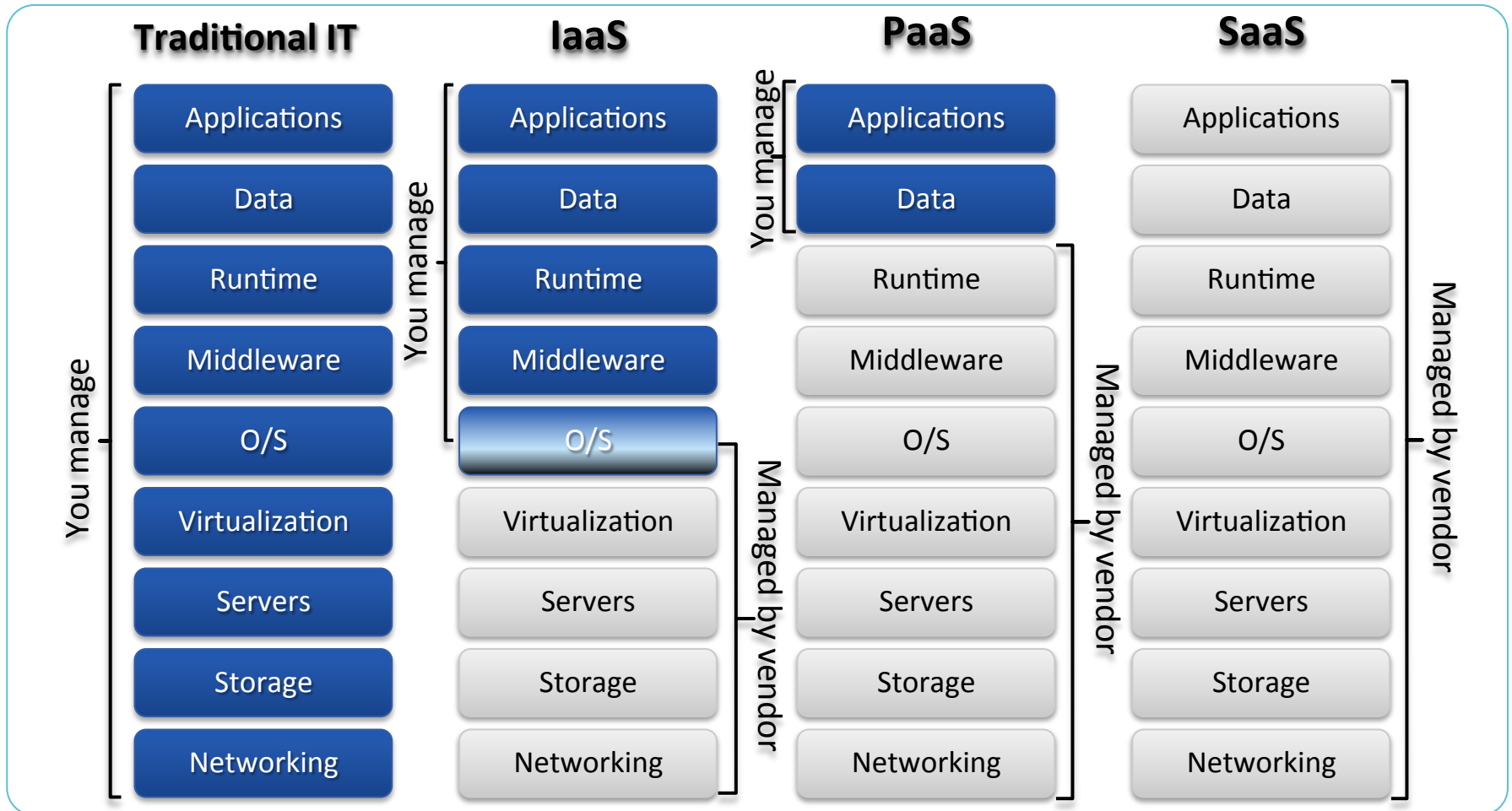
IaaS

Todo or not todo, that's the question.

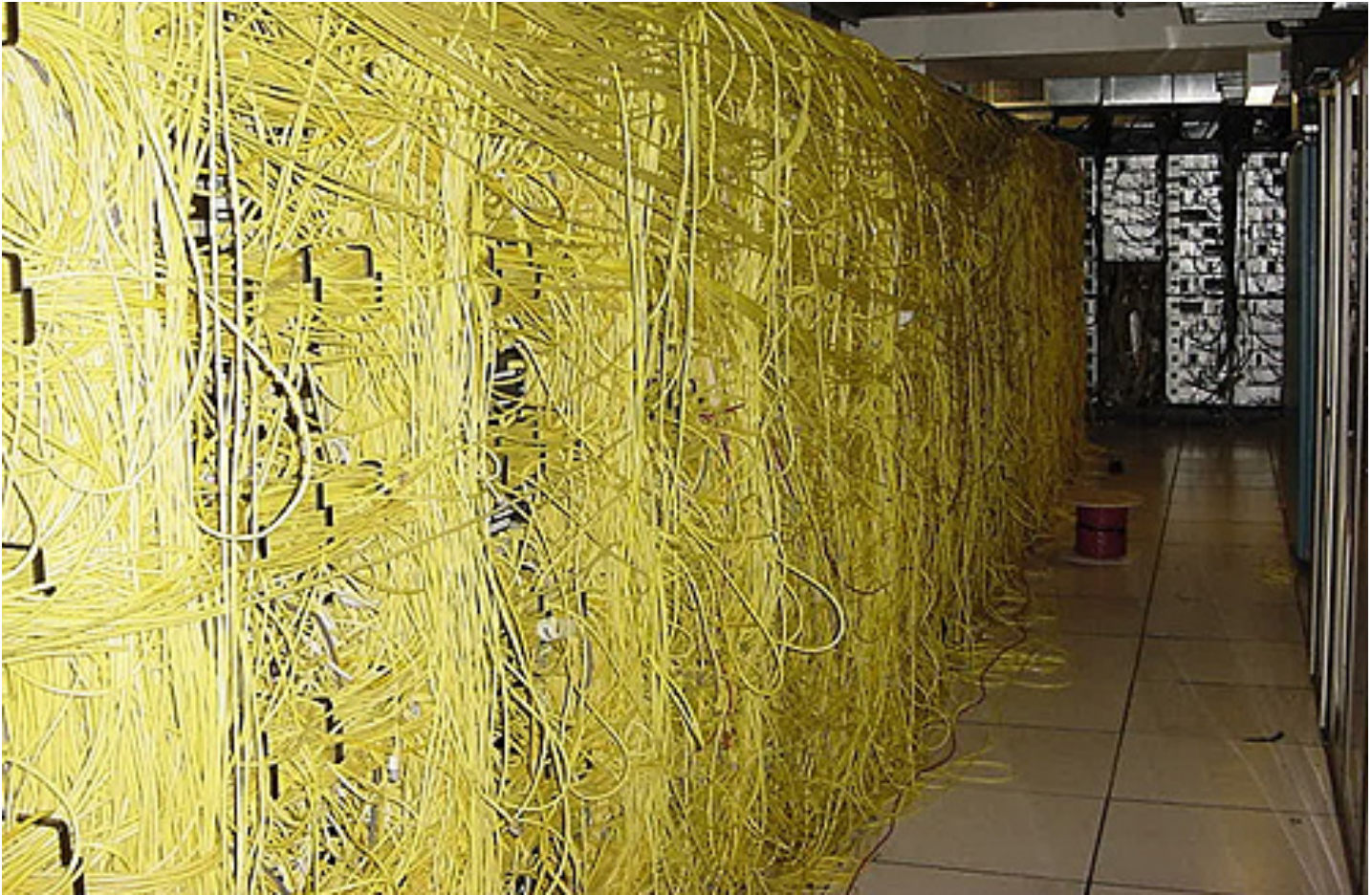
Rogier.Spoor@SURFnet.nl



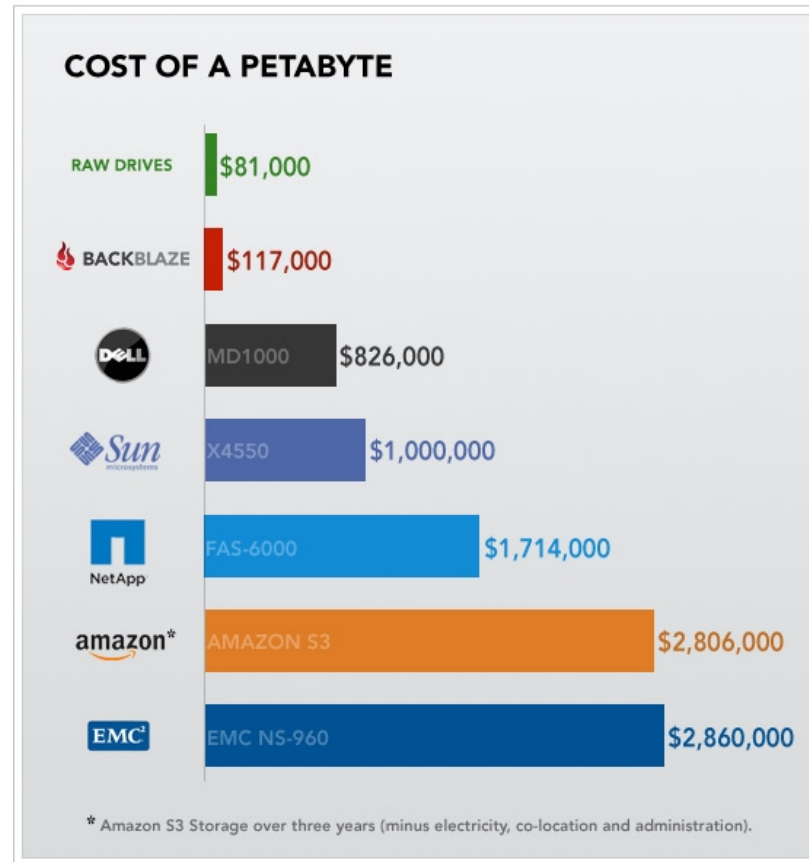
Cloud spectrum



Your datacenter?



Cost of a petabyte (local storage)



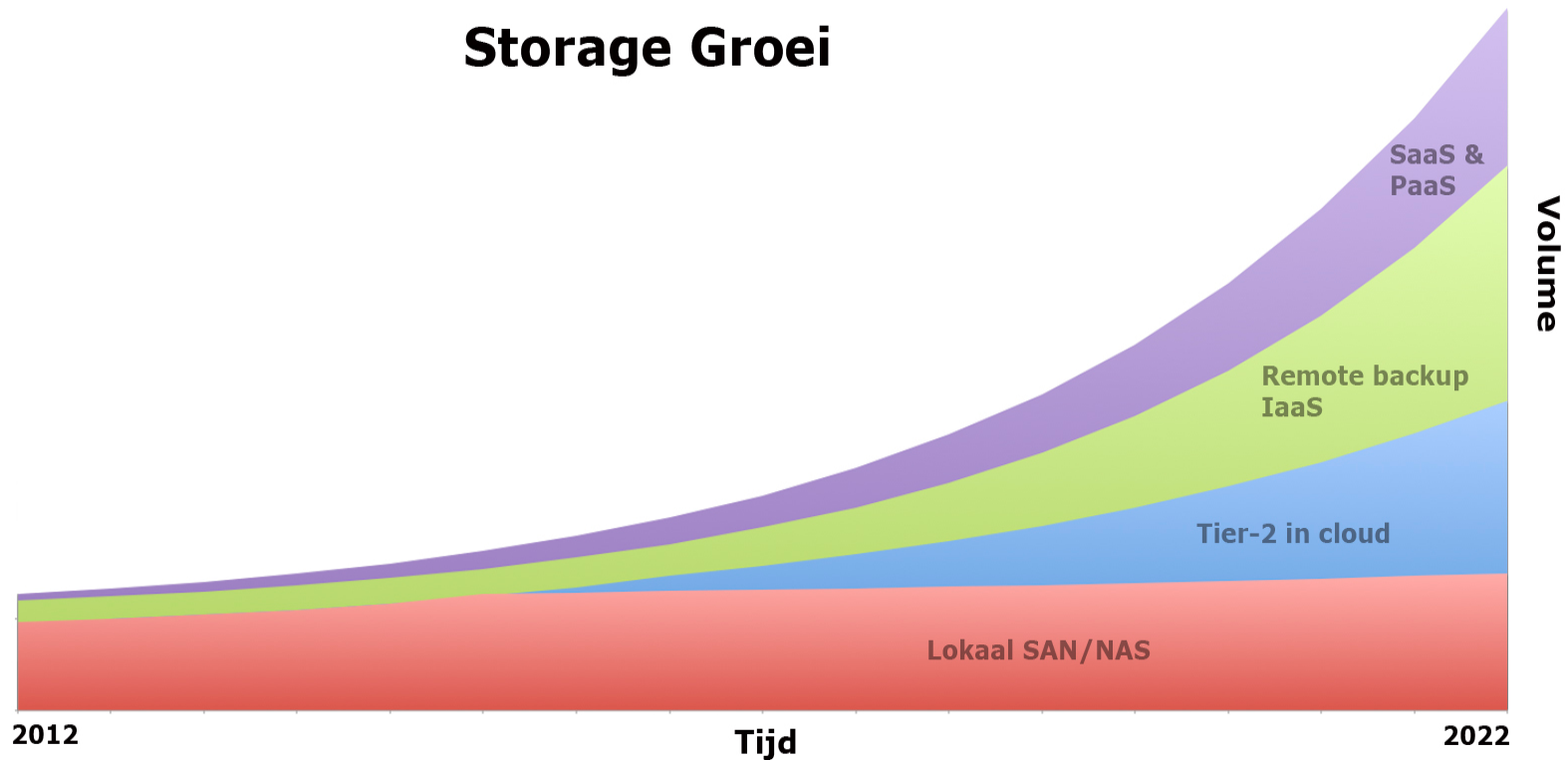
Cost of SURFnet storage

Requirement: geographically redundant, high available

- NetApp (relatively small scale)
6500 per T per year
- Open-E (based on the open components tested in 2010)
230 per T per year
- Typical university setup (bigger is cheaper per T)
2700 per T per year

DC growth 2012-2022

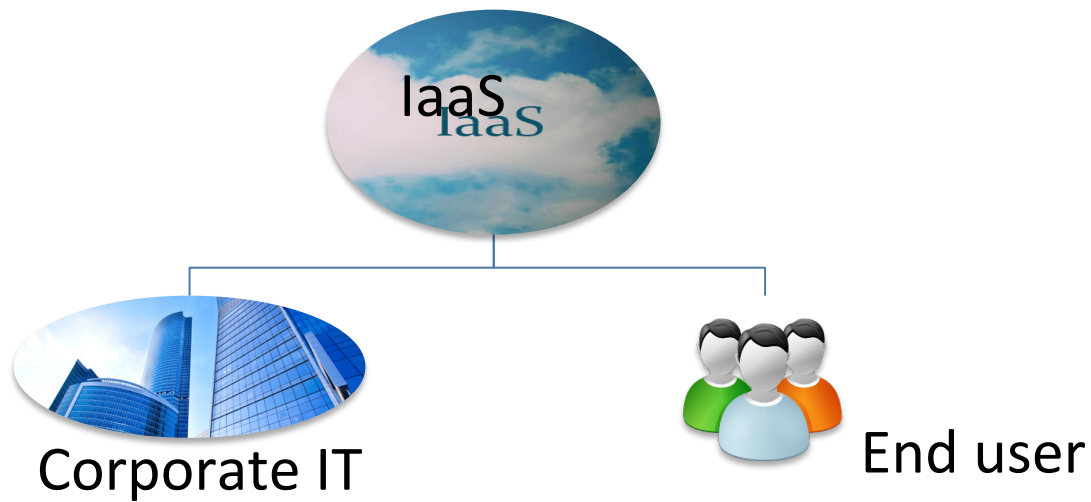
Storage Groei



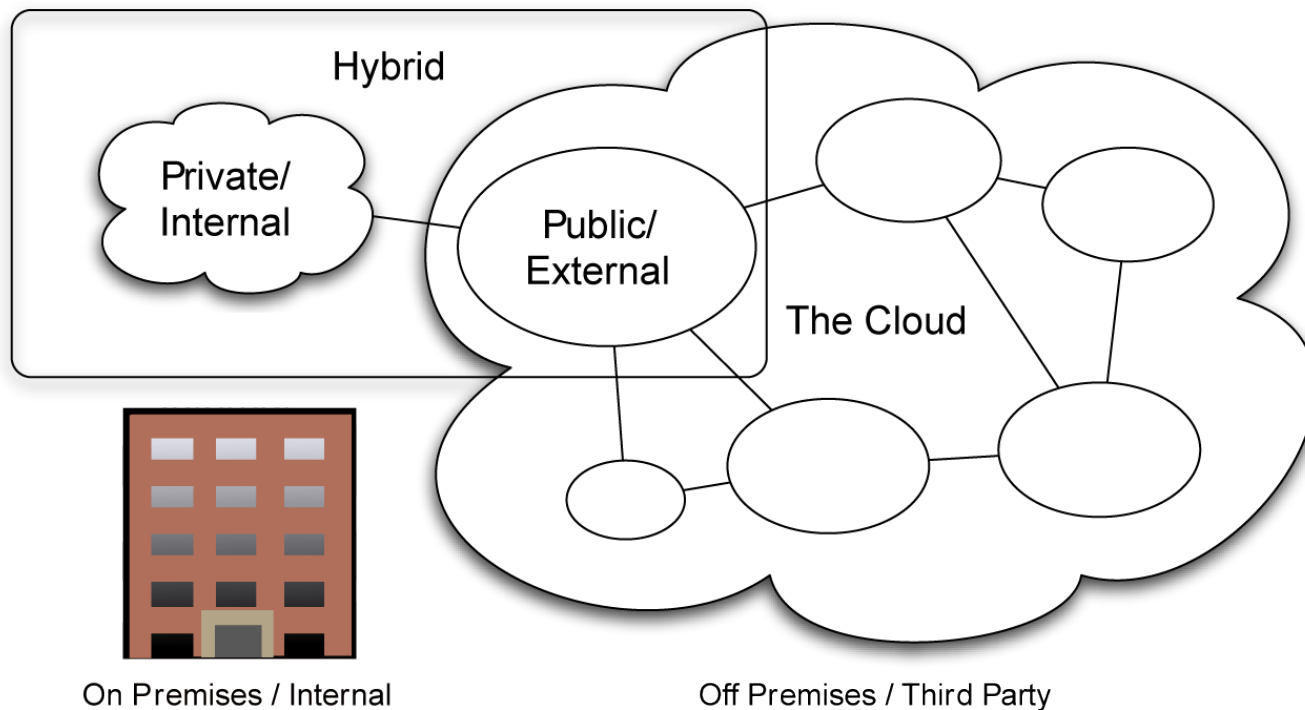
Personal Cloud storage

- Public cloud (dropbox, icloud, ...) USA-based
- SAML based products: google drive, box.net
- Run you own: Skydrive pro, Owncloud,...

Use Cases IaaS



Cloud deployment models



Cloud Computing Types

Community Cloud:

external part (optimal, made available) for specific usergroup

CC-BY-SA 3.0 by Sam Johnston

laaS pilots

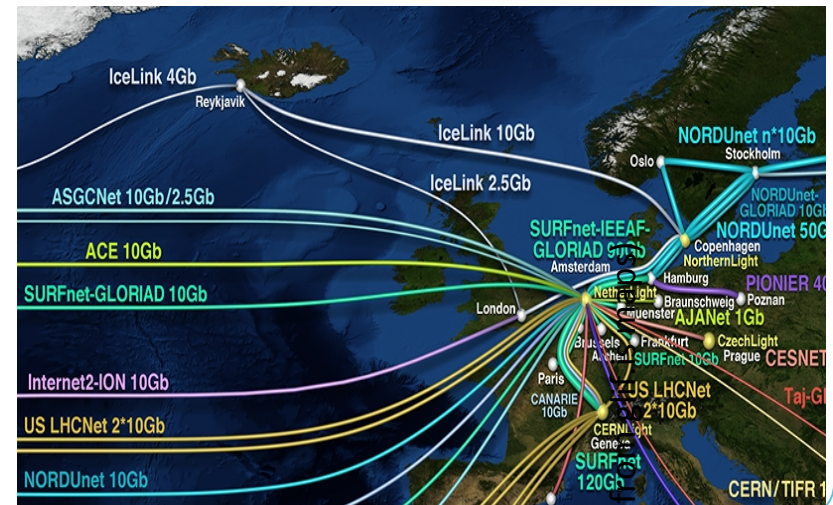
- **Overcapacity sharing?**
- **Own services**
 - Amazon, Rackspace, Azure,...
- **Pilot with institutions:**
 - in the Netherlands:
 - VMware vCloud director
 - Atos Citrix laaS
 - Commercial cloud outside Netherlands (GreenQloud)
 - Different characteristics / use-cases
 - Focus on Green, energy, cooling, equipment
 - Network aspects (inter domain, latency)
 - No data-transfer costs

Focus

- Cloud bursting scenario
- Datacenter integration
- Low cost, high performance storage
 - Synchronous storage
 - Block and object based solutions
- Failover (website)
- Legal

Datacenter integration

- Networking to commercial IaaS cloud
 - Via Netherlight, NORDUnet, ...
 - Use NREN-network capabilities (lightpaths)
 - Start machines behind own firewall?
 - Use NREN IP-space?
 - Reduce networking cost
 - Investigate latency impact



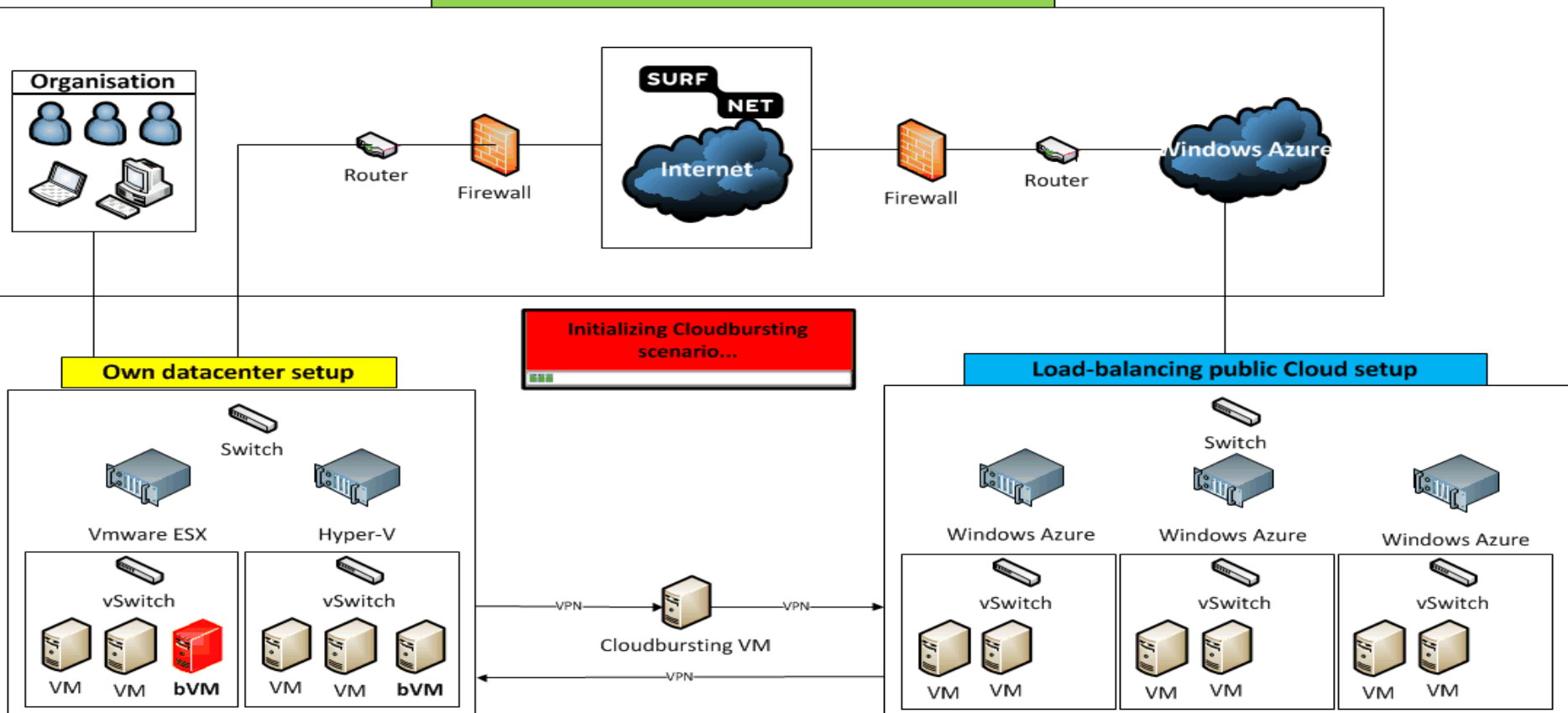
(part

Cloudbursting



bVM = Cloudbursting VM

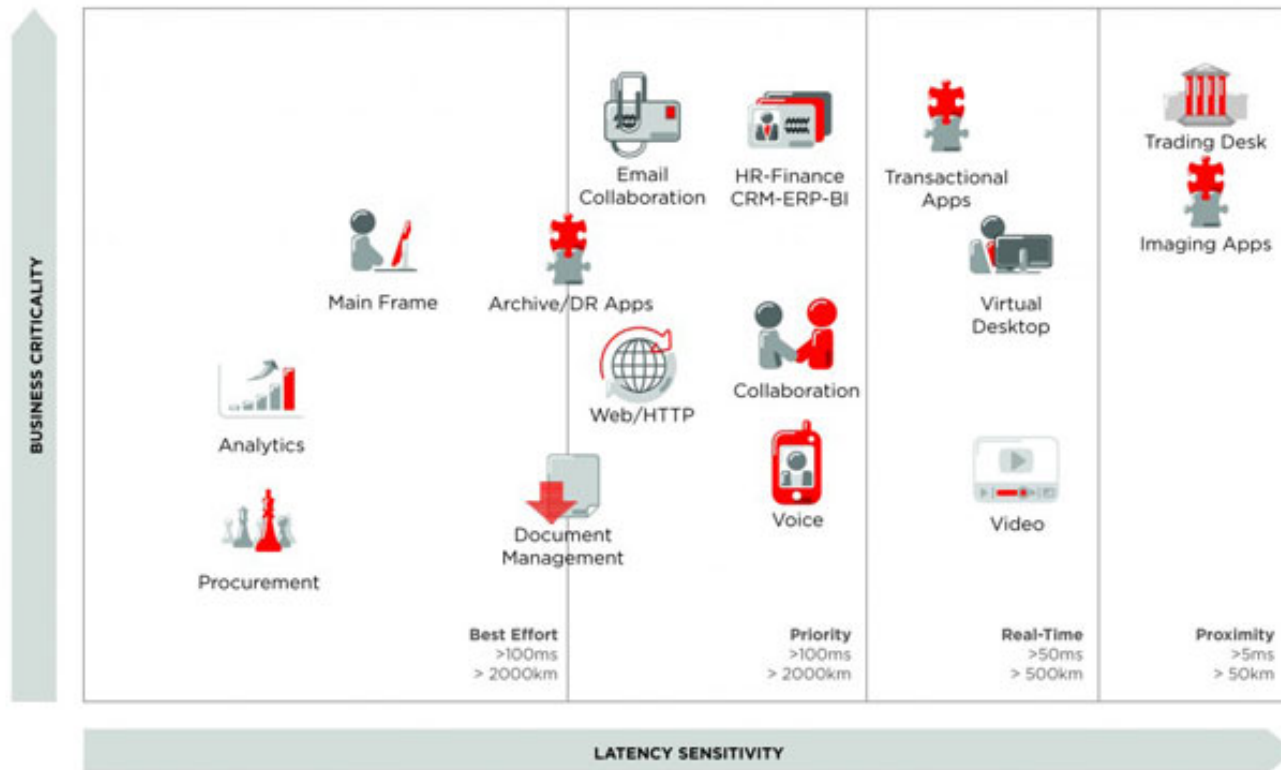
Your own datacenter to Public Azure Cloud



Cloud distance

- Latency is key

VLE? 

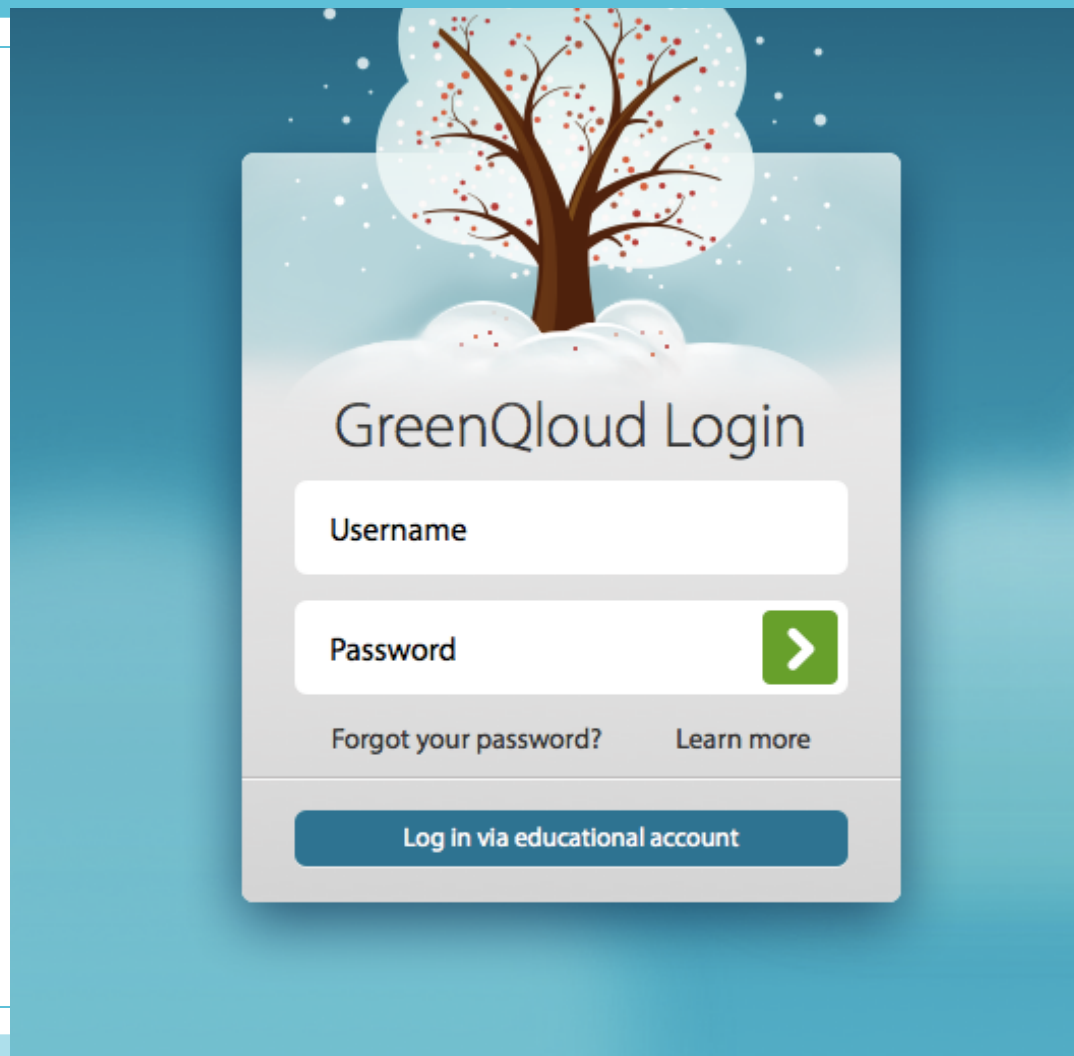


Howto compare IaaS providers

Providers	Variety of Pricing Plans	average	data	data in	Storage costs(/GB)	Scale Up	Scale Out	APIs	Monitoring
<i>Top-of-Mind</i>									
Amazon (EC2)	Pay-as-you-go, year	\$ 154.03	\$ 0.250	\$ -	\$ 0.190	Yes	Yes	Yes	Extensive
Rackspace	Pay-as-you-go	\$ 102.20	\$ 0.180	\$ -	\$ 0.100	Yes	Yes	Yes	Average
GoGrid	Pay-as-you-go, month	\$ 175.20	\$ 0.120	\$ -	\$ 0.150	Yes	Yes	Yes	Poor
Microsoft	Pay-as-you-go, semester	\$ 116.80	\$ 0.145	\$ -	\$ 0.125	Yes	Yes	No	Average
Terremark	Pay-as-you-go	\$ 96.36	\$ 0.170	\$ 0.170	\$ 0.250	Yes	Yes	Yes	Poor
IBM	Pay-as-you-go, year, semester	\$ 211.70	\$ 0.150	\$ 0.150	\$ 0.200	No	No	No	Poor
AT&T	Pay-as-you-go	\$ 653.35	\$ 0.100	\$ 0.100	\$ 0.150	Yes	Yes	No	Poor
Google	Pay-as-you-go	\$ 105.85	\$ 0.120	\$ -	\$ 0.100	Yes	Yes	Yes	Poor
OpSource	Pay-as-you-go, monthly	\$ 67.89	\$ 0.150	\$ -	\$ 0.219	Yes	Yes	Yes	Average
Softlayer	Pay-as-you-go, monthly	\$ 113.15	\$ 0.100	\$ -	\$ 0.120	Yes	Yes	Yes	Extensive
HP	Pay-as-you-go	\$ 58.40	\$ 0.120	\$ -	\$ 0.120	Yes	Yes	Yes	Poor

Source: Techrepublic.com IaaS provider comparison

GreenQloud & SURFconext

The image shows a login interface for GreenQloud. At the top, there is a decorative illustration of a tree with red leaves and white blossoms against a dark blue background with white snowflakes. Below this, the text "GreenQloud Login" is displayed in a dark grey font. Underneath, there are two input fields: "Username" and "Password". The "Password" field has a green button with a white right-pointing arrow. Below the input fields, there are two links: "Forgot your password?" and "Learn more". At the bottom, there is a dark blue button with the text "Log in via educational account".

GreenQloud Login

Username

Password

[Forgot your password?](#) [Learn more](#)

Log in via educational account

Pricing IaaS cloud

- difficult to compare vendors on VM specs
- Running a VM 24 hrs/day -> 2000,- euro/year in cloud
- Universities report running VM costs 1000-2000 euro/year
- VMware based public clouds are expensive
- Enterprise support is non-standard, pay extra
- Data transfer costs relatively high

Public IaaS Cloud interesting when..

- Controllable bursting scenario's
- Flexibility needed
- Startups (no install base, easy scale)
- Educational software licenses available
- DTA environment (OTA in dutch)
- Cloud SLA meets demands
- Lack of internal expertise
- No local-cloud integration needed is (DC, IP-based)



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