EDGE COMPUTING
Trend oder Hype

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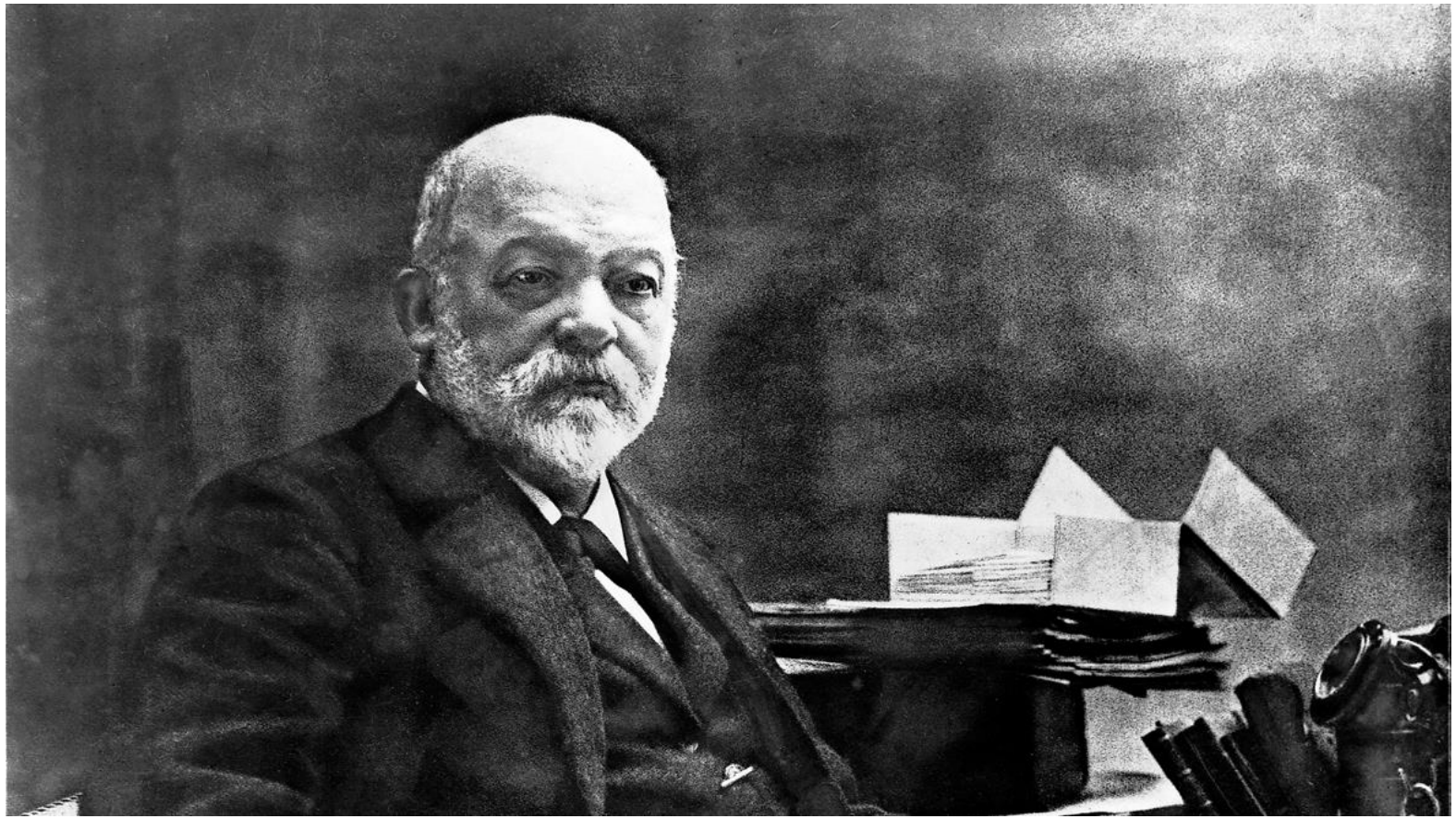
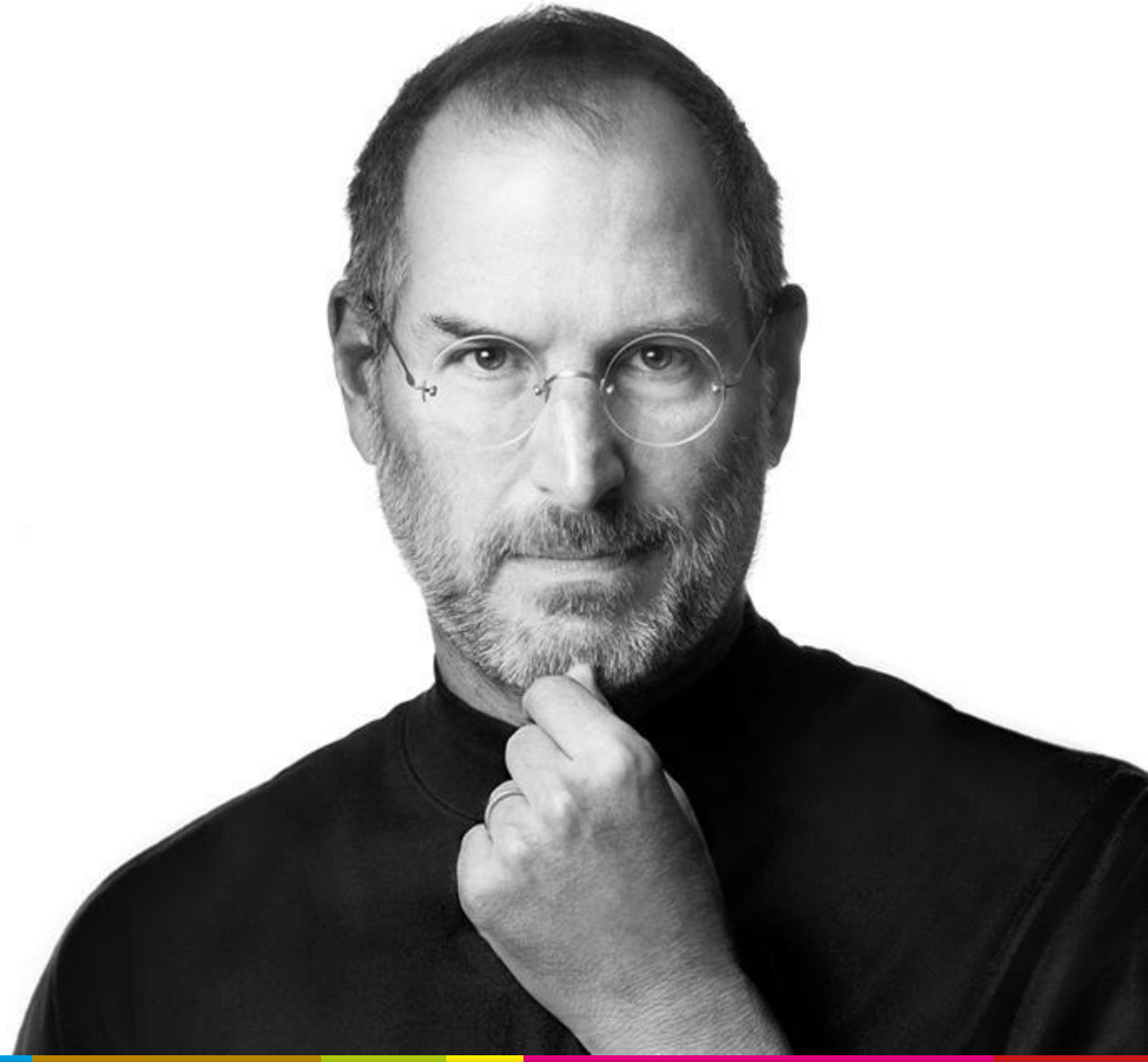
PLANUNG
RECHENZENTRUMSBAU
BETRIEB +
WARTUNG

Wir werden maximal 5000 solcher Fahrzeuge pro Jahr bauen, denn es gibt einfach zu wenige Chauffeure….

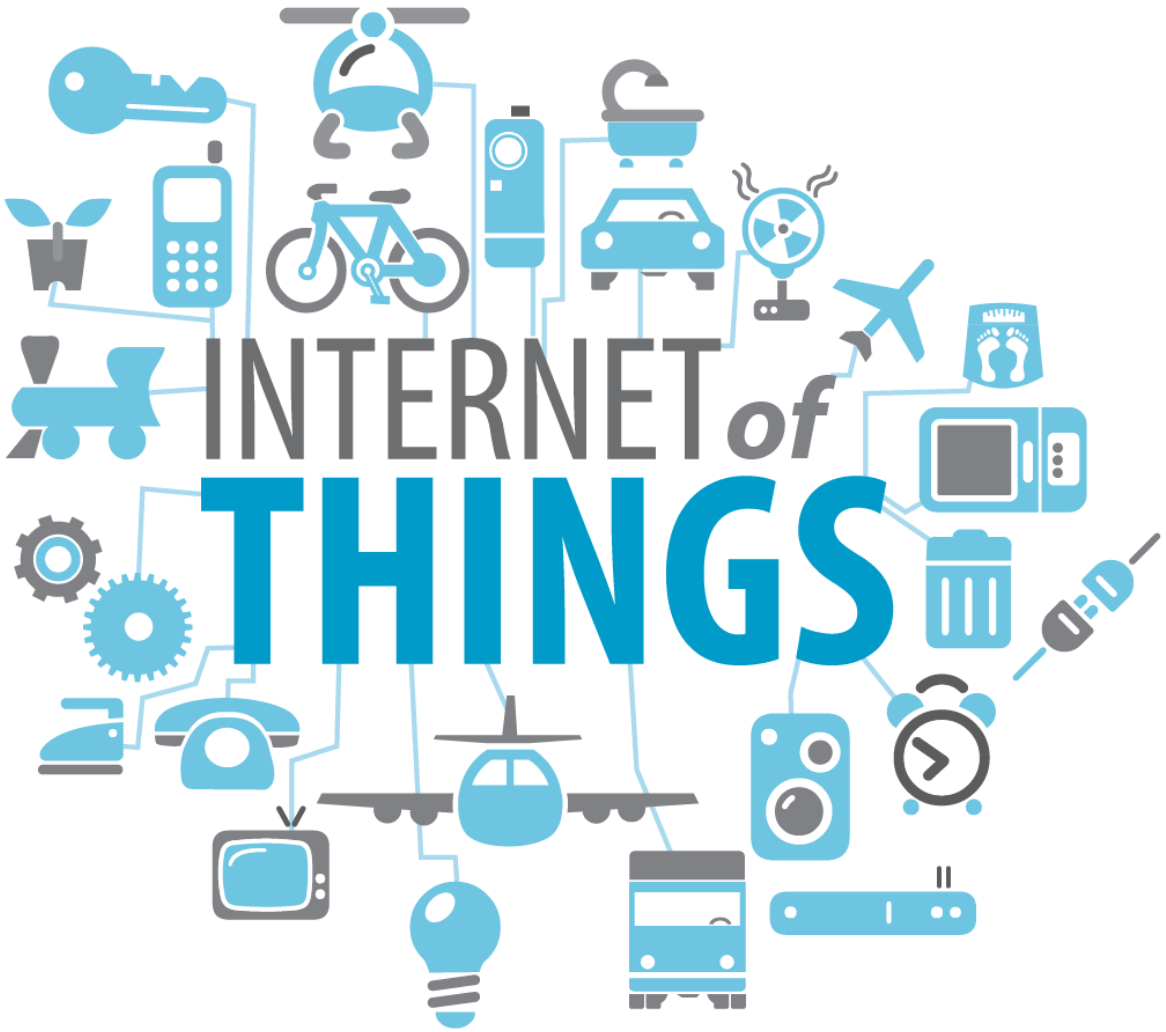
Gottlieb Daimler

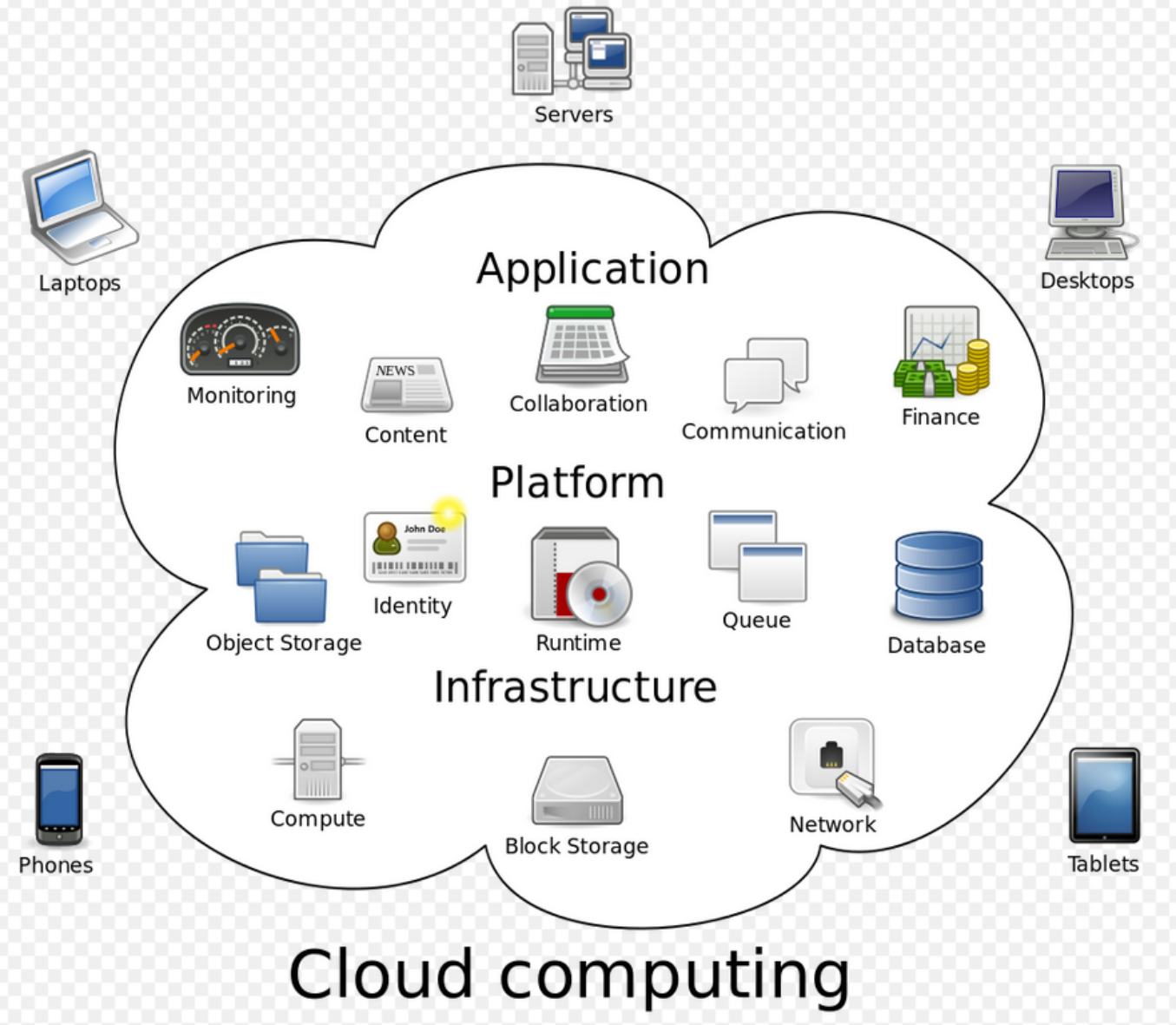


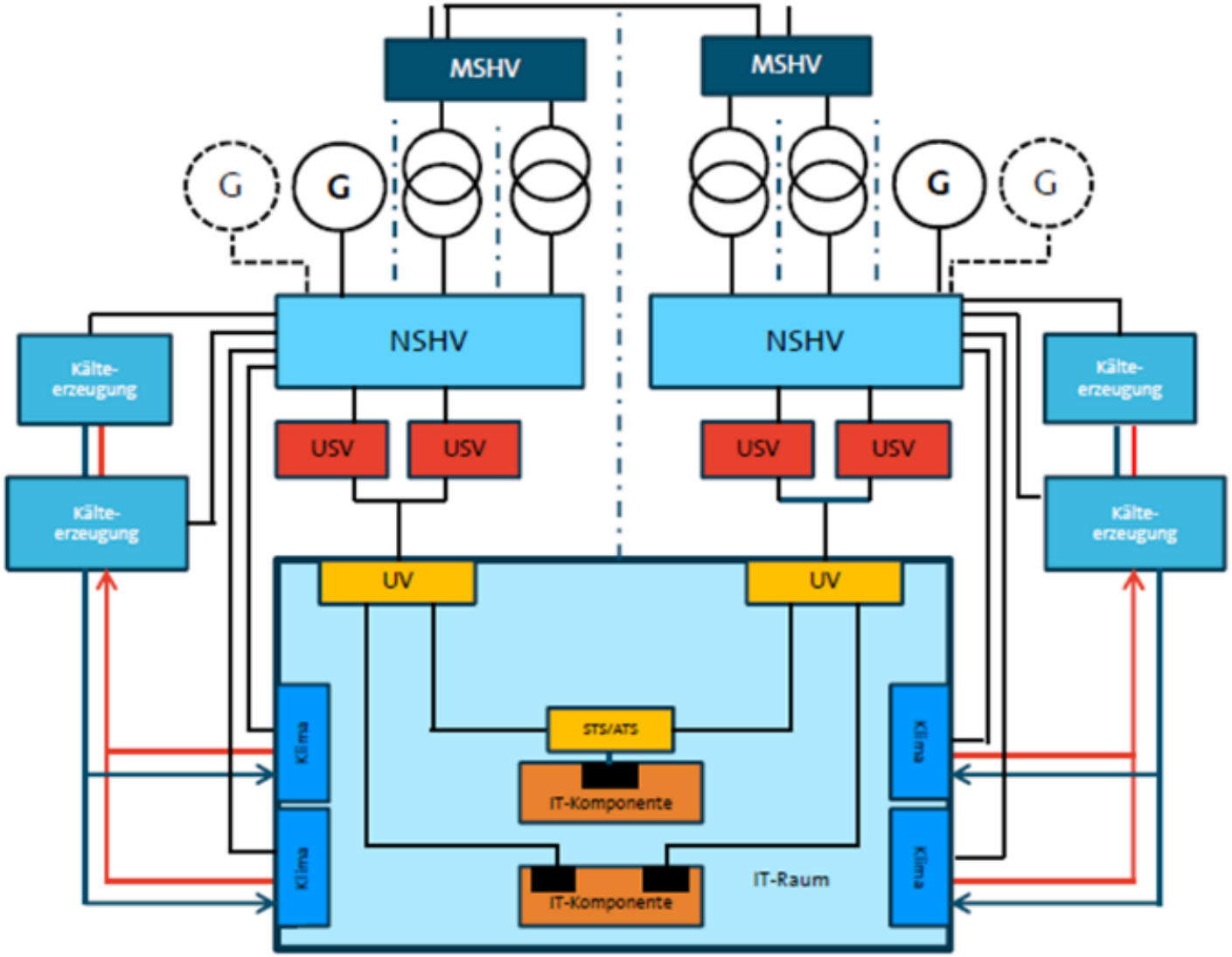
PALDING & BROS.



Leistungsübersicht


INTERNET of
THINGS


Servers
Laptops
Desktops
Application
Monitoring
Content
Collaboration
Communication
Finance
Platform
Object Storage
Identity
Runtime
Queue
Database
Infrastructure
Compute
Block Storage
Network
Phones
Tablets
Cloud computing

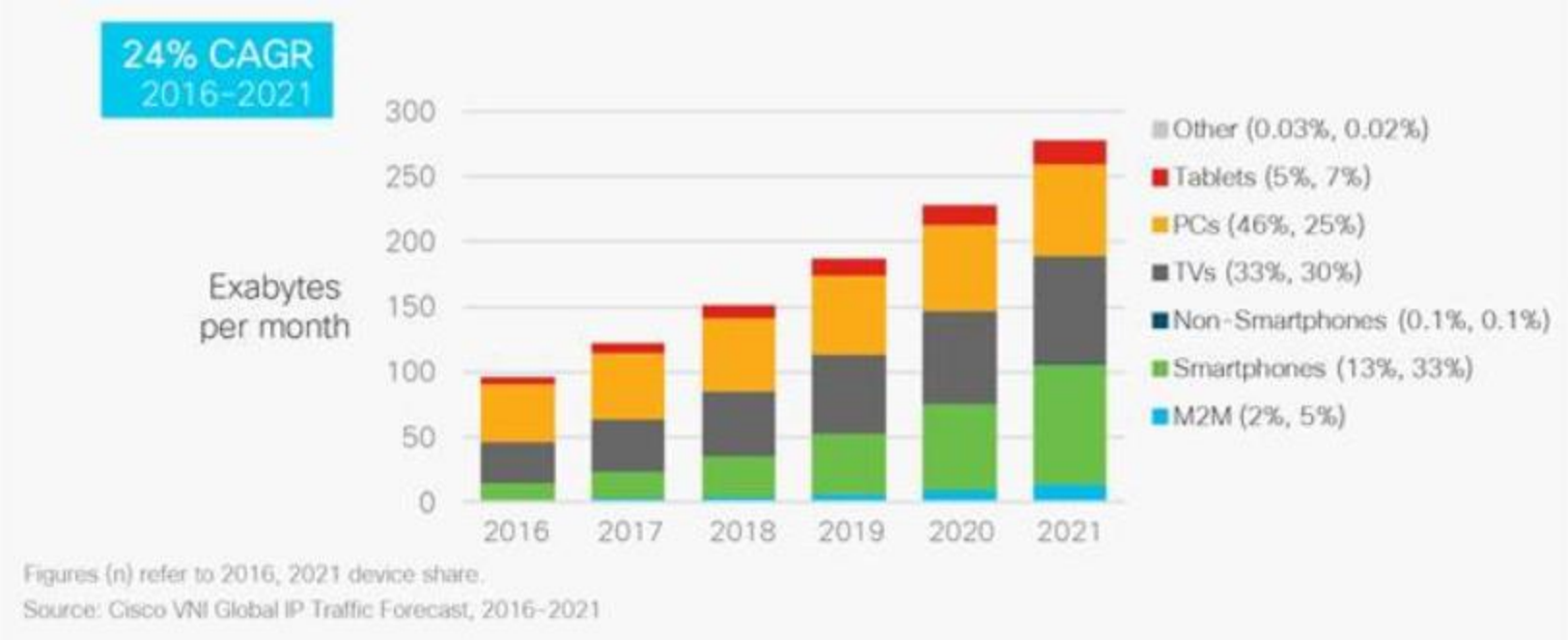

MSHV
MSHV
G
G
G
G
NSHV
NSHV
Kälte-
erzeugung
Kälte-
erzeugung
Kälte-
erzeugung
Kälte-
erzeugung
USV
USV
USV
USV
UV
UV
STS/ATS
IT-Komponente
IT-Komponente
IT-Raum
Klima
Klima
Klima
Klima

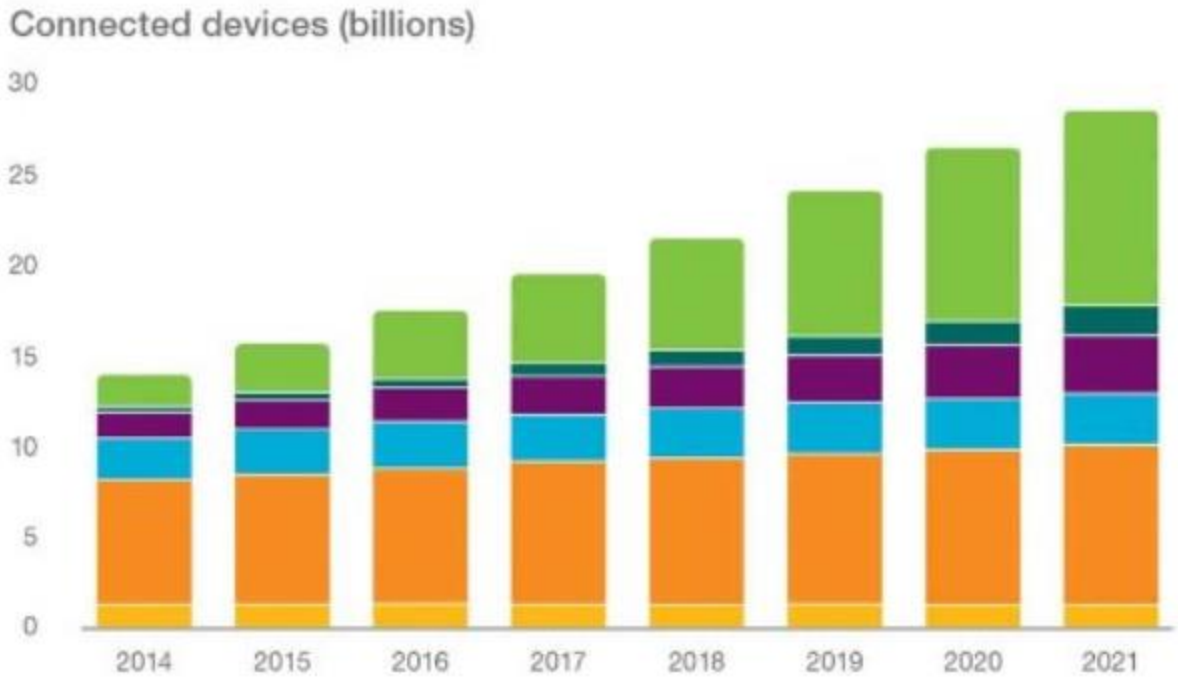
Kühlung

Netzwerk

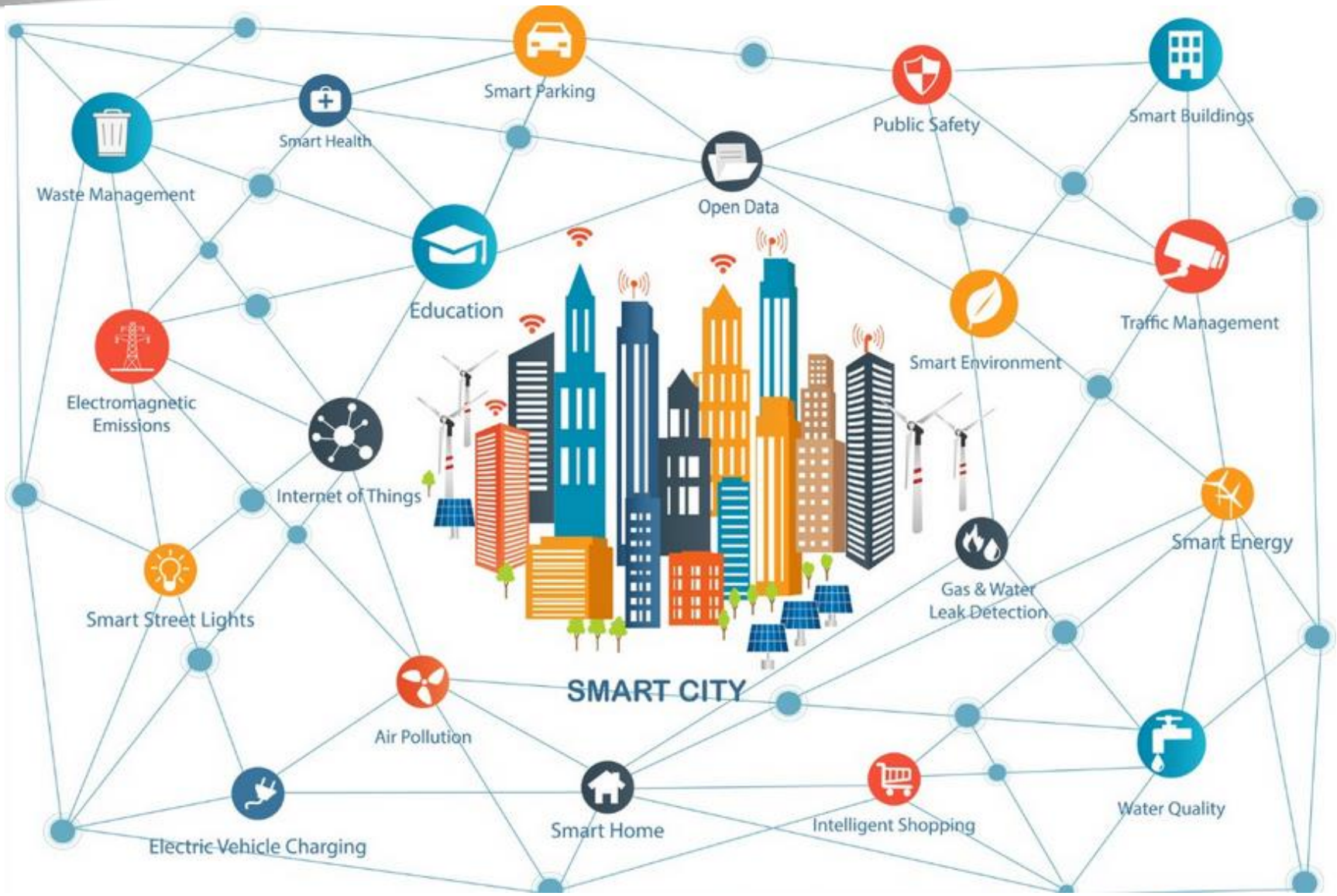
Speicher

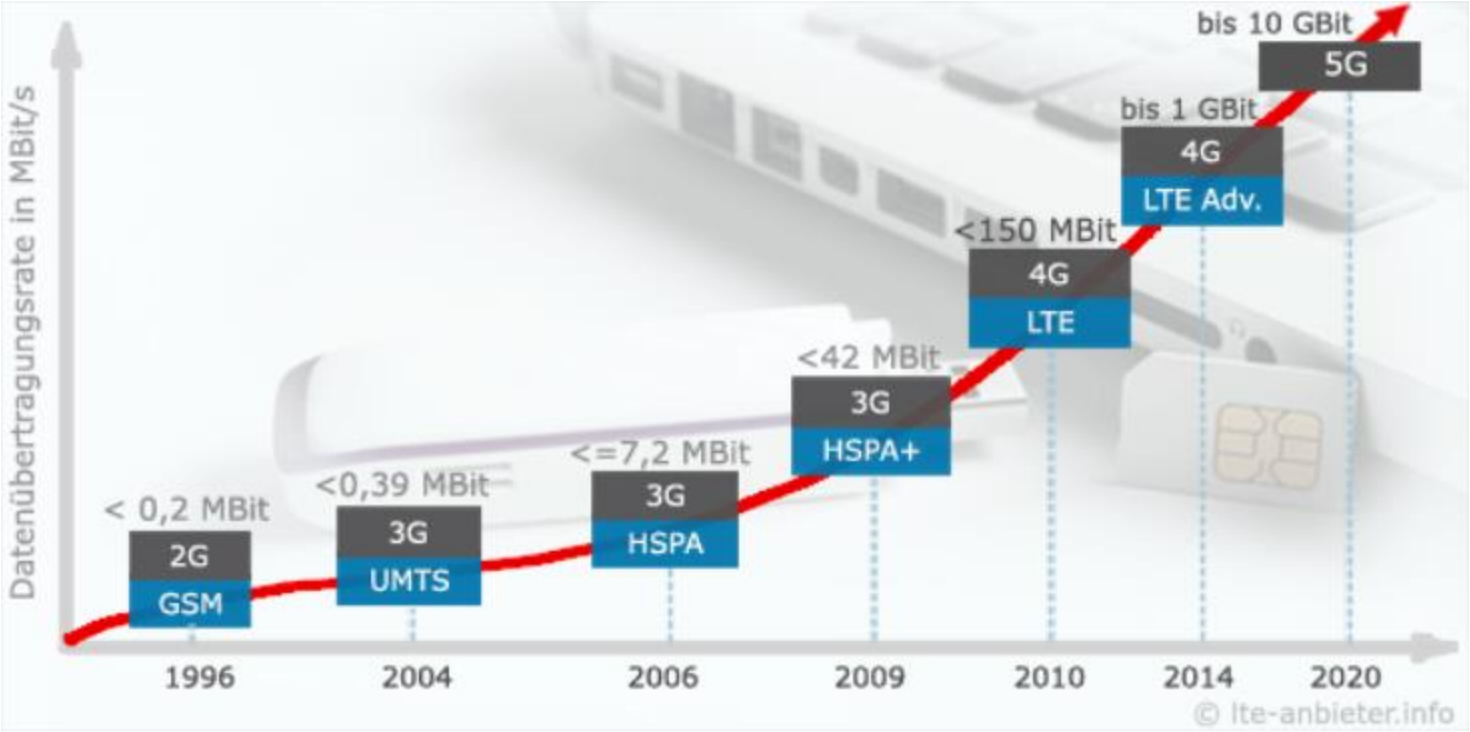
Server

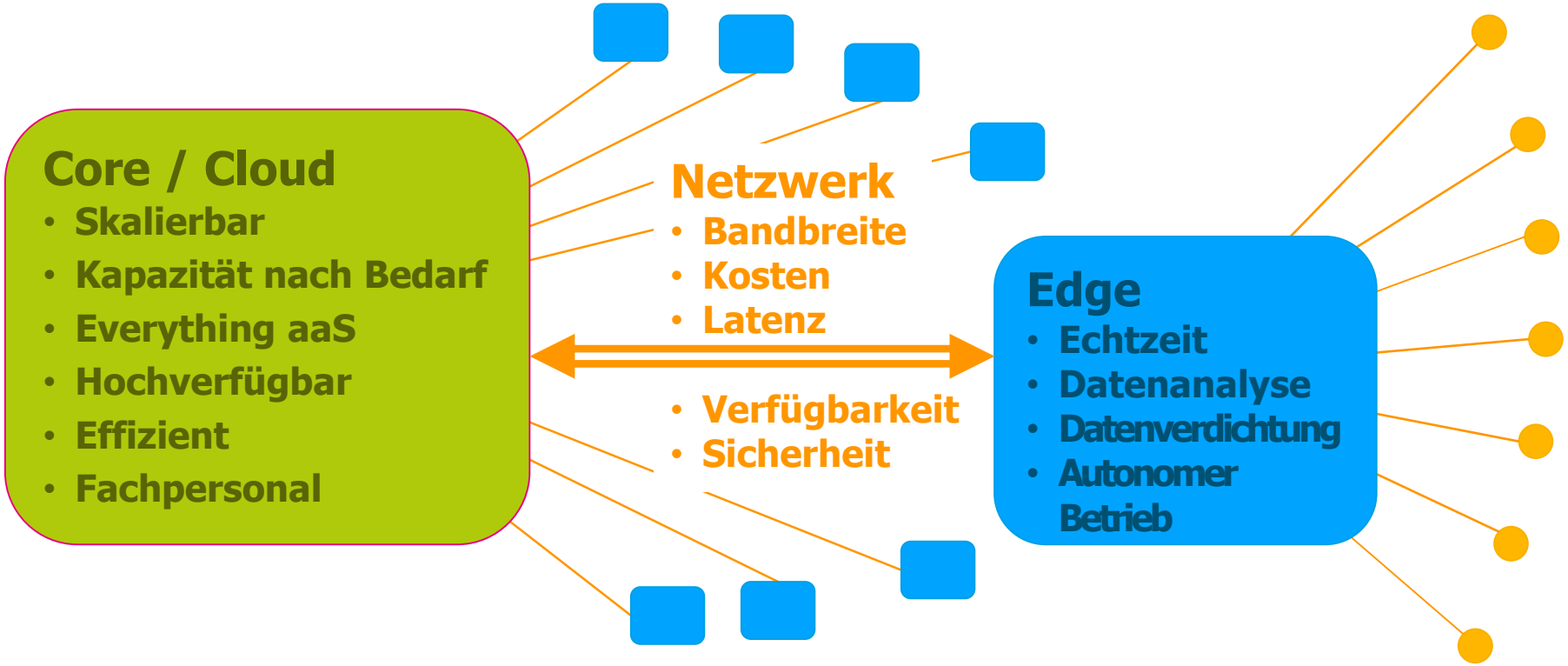

24% CAGR
2016-2021
Exabytes
per month
300
250
200
150
100
50
0
2016
2017
2018
2019
2020
2021
Other (0.03%, 0.02%)
Tablets (5%, 7%)
PCs (46%, 25%)
TVs (33%, 30%)
Non-Smartphones (0.1%, 0.1%)
Smartphones (13%, 33%)
M2M (2%, 5%)
Figures (n) refer to 2016, 2021 device share.
Source: Cisco VNI Global IP Traffic Forecast, 2016-2021



	15 billion	28 billion
M2M: non-cellular	2.6	10.7
M2M and consumer electronics; cellular	0.4	1.5
Consumer electronics; non-cellular	1.6	3.1
PC/laptop/tablet	2.4	2.8
Mobile phones	7.1	8.7
Fixed phones	1.3	1.4
	2015	2021


Smart Parking
Smart Health
Public Safety
Smart Buildings
Waste Management
Open Data
Education
Traffic Management
Smart Environment
Electromagnetic Emissions
Internet of Things
Smart Energy
Gas & Water Leak Detection
Smart Street Lights
SMART CITY
Air Pollution
Water Quality
Intelligent Shopping
Smart Home
Electric Vehicle Charging


Datenübertragungsrate in MBit/s
< 0,2 MBit
2G
GSM
<0,39 MBit
3G
UMTS
<=7,2 MBit
3G
HSPA
<42 MBit
3G
HSPA+
<150 MBit
4G
LTE
bis 1 GBit
4G
LTE Adv.
bis 10 GBit
5G
1996
2004
2006
2009
2010
2014
2020
© lte-anbieter.info


Core / Cloud
• Skalierbar
• Kapazität nach Bedarf
• Everything aaS
• Hochverfügbar
• Effizient
• Fachpersonal
Netzwerk
• Bandbreite
• Kosten
• Latenz
• Verfügbarkeit
• Sicherheit
Edge
• Echtzeit
• Datenanalyse
• Datenverdichtung
• Autonomer Betrieb

Datenintensive Anwendungsfälle (Data Intensive)

- **Smart City**
- **Smart Factory**
- **High Performance Computing**
- **Virtual Reality**
- **Digitalisierung von Öl- oder Gasbohrungen**
- **Video Streaming**

Menschliche Reaktionen (Human-Latency Sensitive)

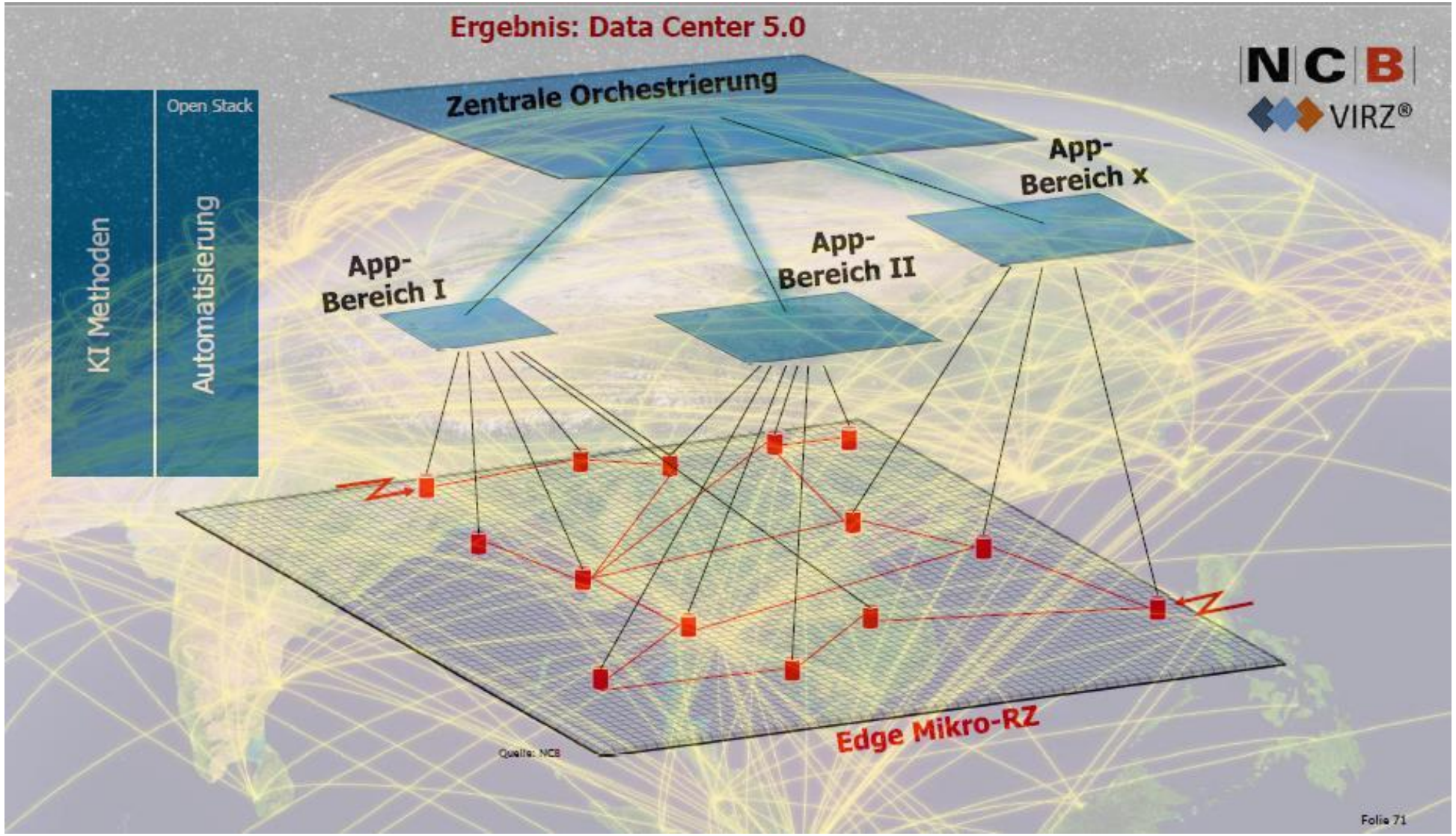
- **Smart Shopping/Smart Retail**
- **Übersetzungsdienste**
- **Augmented Reality**
- **Optimierung von Webseiten**

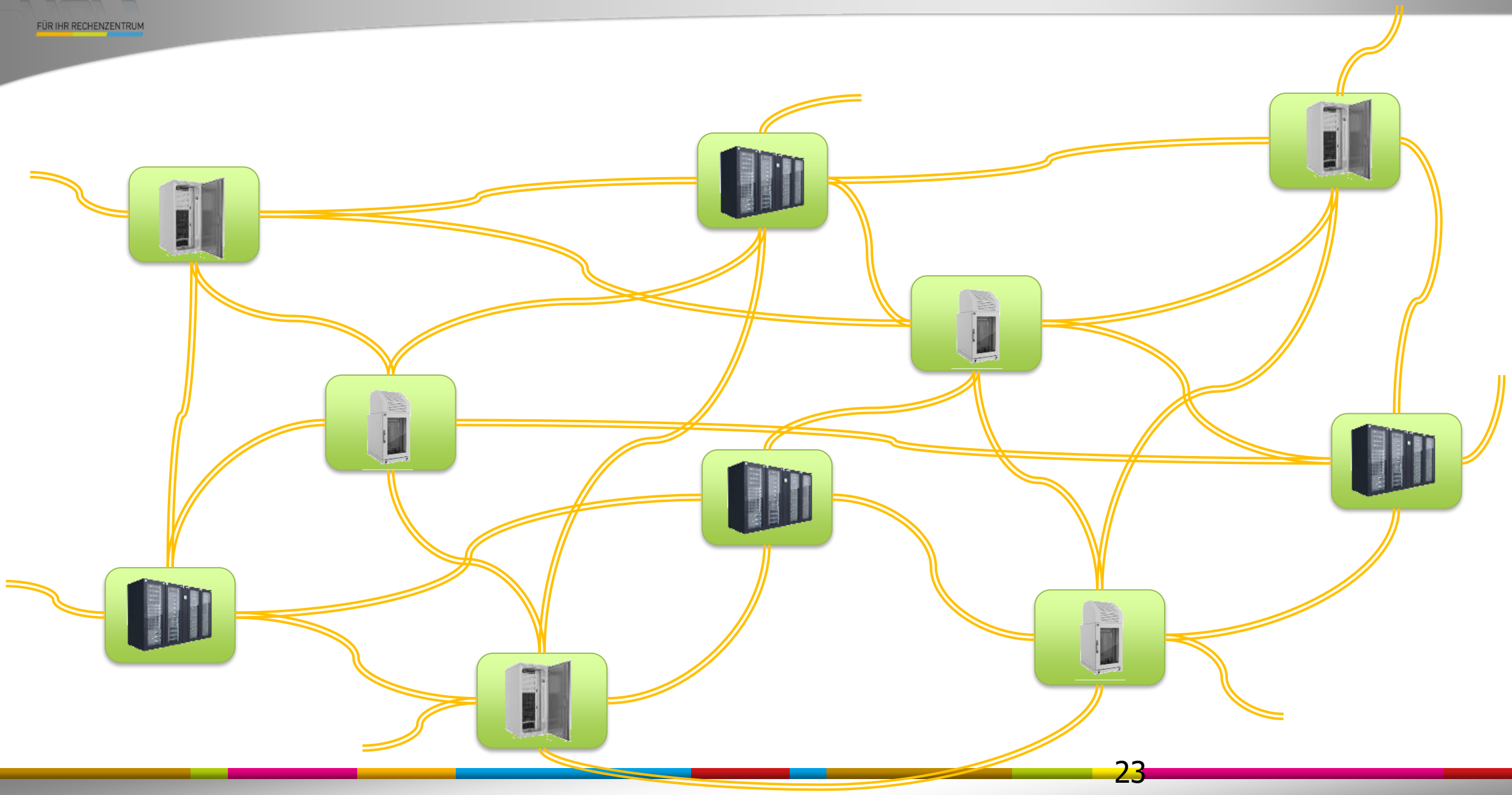
Latenzsensitiver Datenverkehr von Maschine zu Maschine (M2M Latency Sensitive)

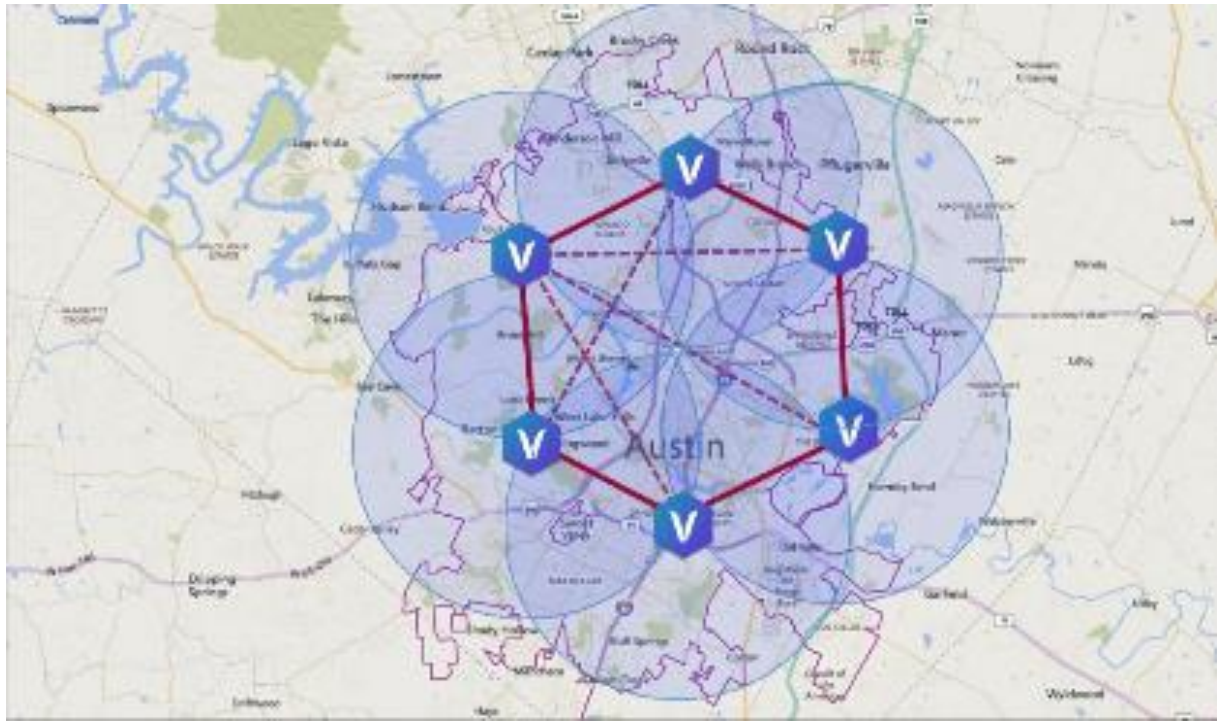
- **Aktienmärkte (Simulationen, Transaktionsabwicklung)**
- **Intelligente Gridsysteme**
- **Militärische Steuerung und Überwachung**
- **Echtzeitanalysen**

Konsequenzen für Gesundheit und Sicherheit (Life Critical)

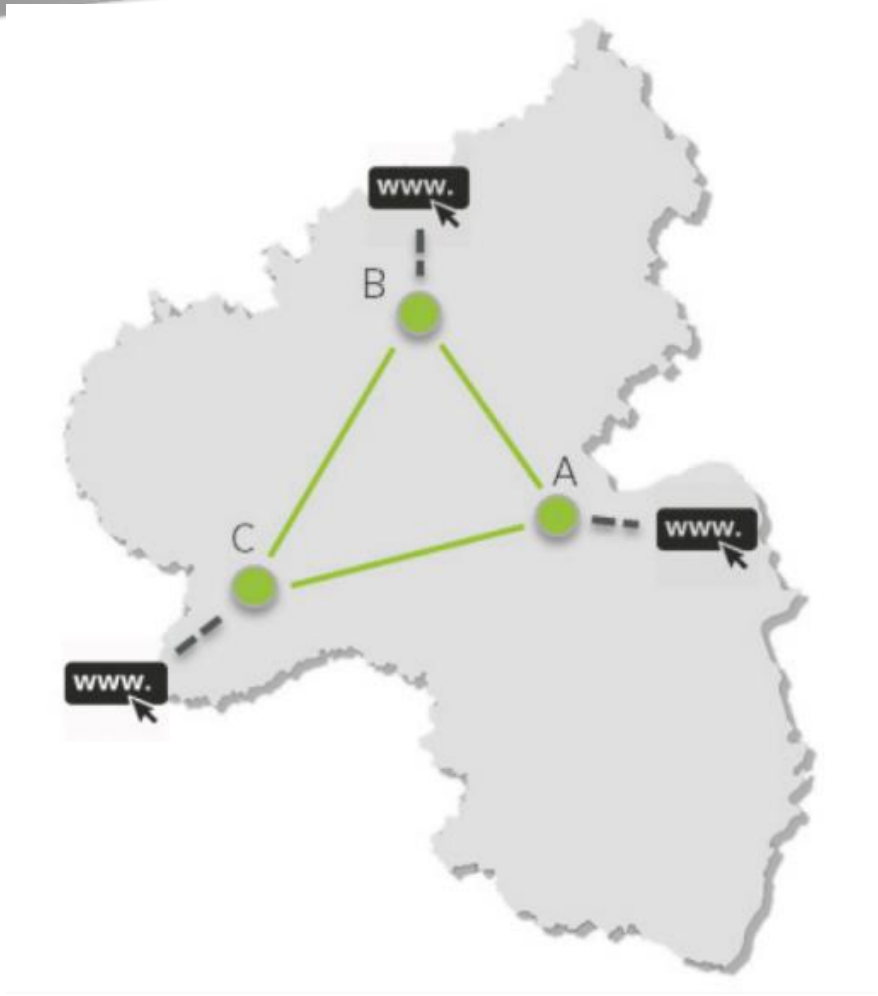
- **Transport und Logistik**
- **Autonome Fahrzeuge (Autos, Drohnen, Roboter)**
- **Smart Medicine**

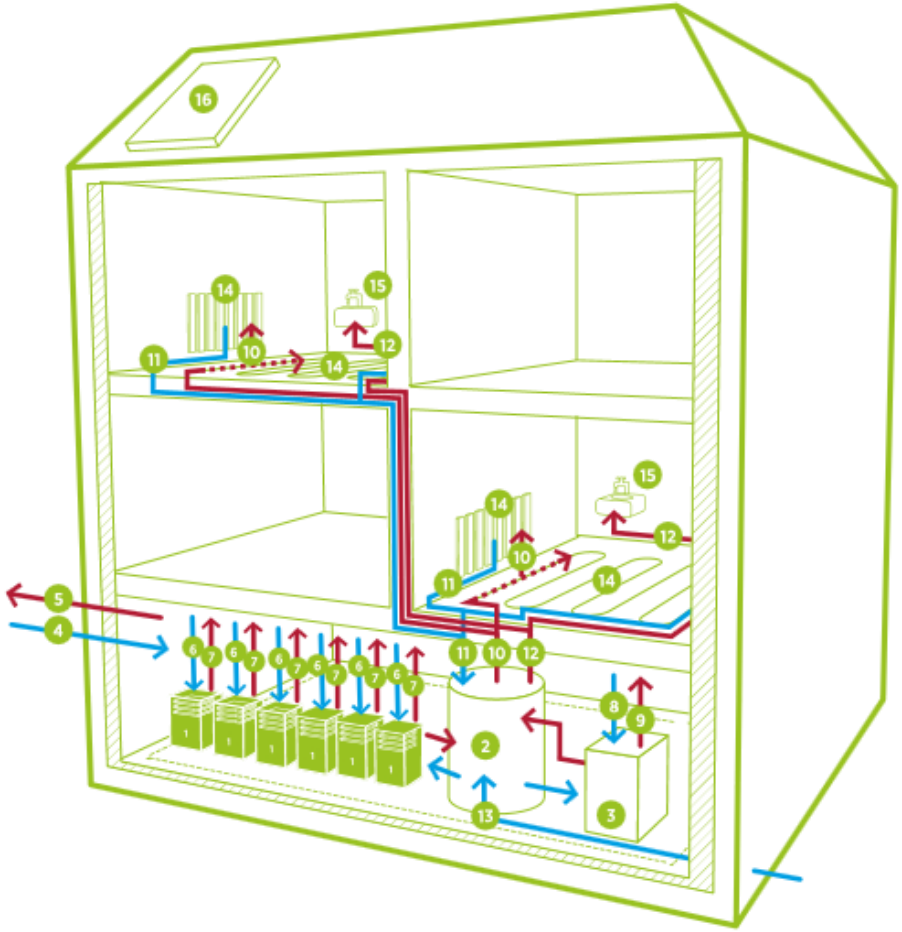

Ergebnis: Data Center 5.0
NCB
VIRZ®
Zentrale Orchestrierung
Open Stack
KI Methoden
Automatisierung
App-Bereich x
App-Bereich II
App-Bereich I
Edge Mikro-RZ
Quelle: NCB
Folie 71





Vapor IO "Kinetic Edge"





Innogy und Cloud & Heat

Prior1

TÜV

Edge Computing: Anwendungen

- Cloud Services
- Content Anbieter
- Video Streaming
- Virtual Reality

... auch in Colocation

- Filialen von Großbetrieben
- Bankfilialen
- Einzelhandel, Lager
- Fabriken
- Behörden

- Wissenschaftliche Rechenzentren
- High Performance Computing

- KMU allgemein
- Krankenhäuser
- Schulen, Universitäten
- Arztpraxen, Kanzleien

- Internet der Dinge (IoT)
- Sensor/Aktor Netzwerke
- Smart City, Grid …
- Object / Face Recognition
- Autonomes Fahren

Frage-/Diskussionsrunde