

# We are all online: Internet in the times of Corona

---



Marco Brandstätter  
Regional Director  
Middle East & South Asia  
DE-CIX



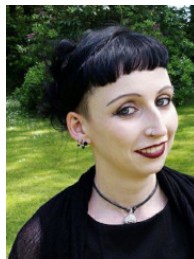
# Lots of data, lots of data crunchers



Anja Feldmann  
MPII



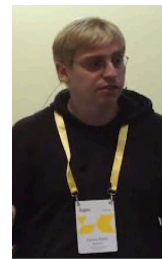
Oliver Gasser  
MPII



Franziska Lichtblau  
MPII



Enric Pujol  
BENOCS



Ingmar Poesch  
BENOCS



Christoph Dietzel  
DE-CIX



Daniel Wagner  
DE-CIX



Matthias Wichtlhuber  
DE-CIX



Juan Tapiador  
Universidad Carlos III  
de Madrid



Narseo Vallina Rodriguez  
IMDEA Networks, ICSI



Oliver Hohlfeld  
Brandenburg University  
of Technology



Georgios  
Smaragdakis  
TU Berlin, MPII



**DE-CIX at a glance**

**Easy Interconnection.  
Anywhere!**



# The world's largest neutral interconnection ecosystem



**2,200+**  
ASNs  
Connected networks

**25** IXs  
11 Interconnected  
NYC, LIS, MAD, MRS, DXB,  
FRA, DUS, HAM, MUC, IST,  
PMO

**500+**  
Access  
Points

**100+**  
Countries

**66+**  
TB  
Connected  
Capacity

**18+** Tbps  
Peak Traffic



# *Topic of today: Internet in times of Corona*



*Where networks meet*

[www.de-cix.net](http://www.de-cix.net)

## A very special moment



Our **physical** lives almost on pause globally.

All our fundamentals are affected (health, education, transport, logistic chain...)

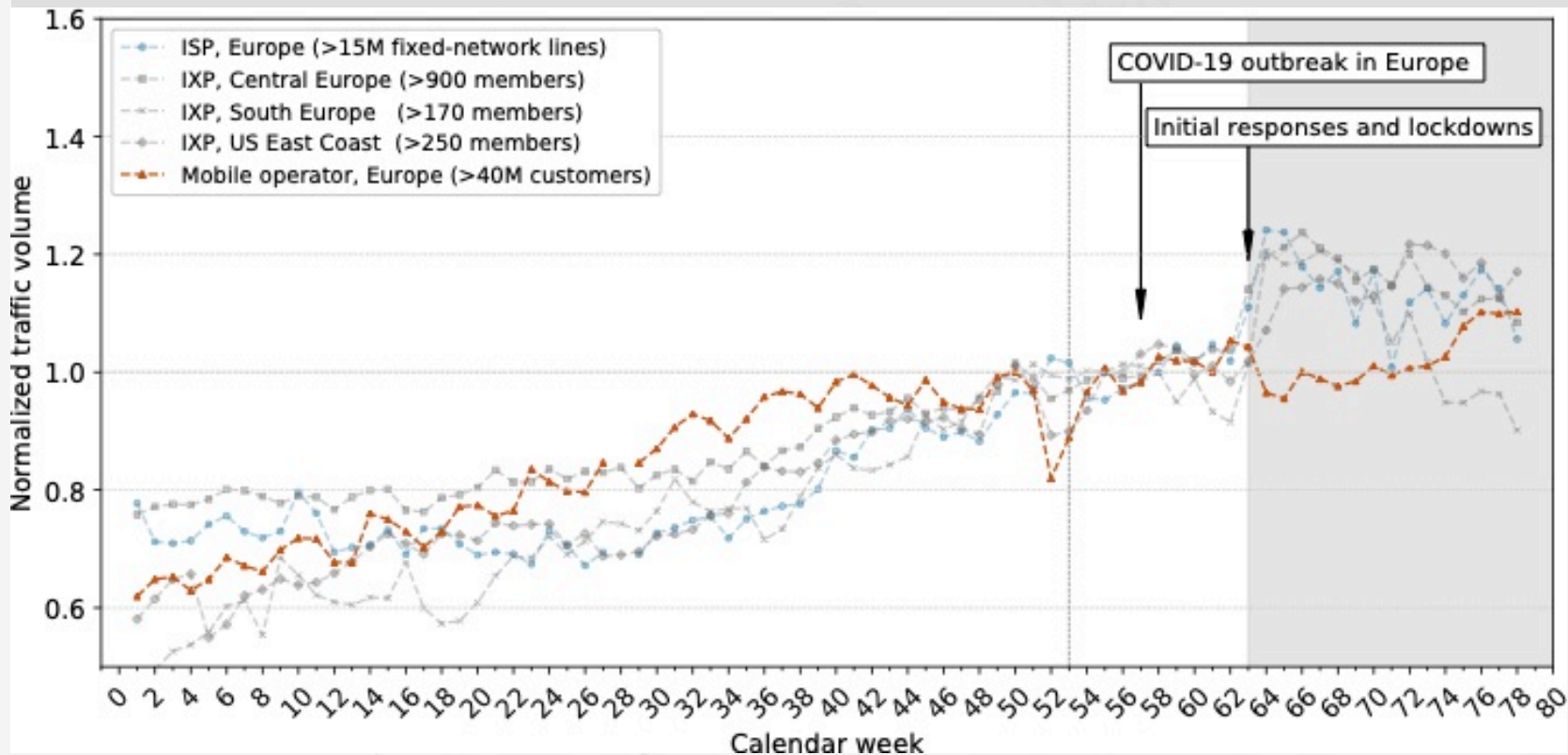
Most activities fully transferred or complemented by the **digital sphere** to ensure continuity of the institutional, private & business life, and contribute to the resolution of the crisis

# Traffic patterns @ DE-CIX – General hits & shifts

Before	Since the crisis
+10-50% peak increase per <b>annum</b>	+10-50% average increase traffic in <b>days</b>
Steady growth, new peaks in <b>fall &amp; winter</b> (sometimes live events, updates, or releases)	New peaks correlate with <b>lockdowns</b> (exact dates varying by region)
<b>Stable</b> distribution of traffic/applications (e.g. video, CDN content, web)	<b>Extreme</b> rise of some applications (e.g. collaborative tools, gaming, video)
<b>Diurnal</b> cycles, morning & night low	Significantly <b>more</b> traffic during the days, <b>higher</b> amplitudes, and <b>higher</b> peaks

**Same outcome at all DE-CIX hubs**  
**Different boosters of traffic**  
**Similar explanatory factors**

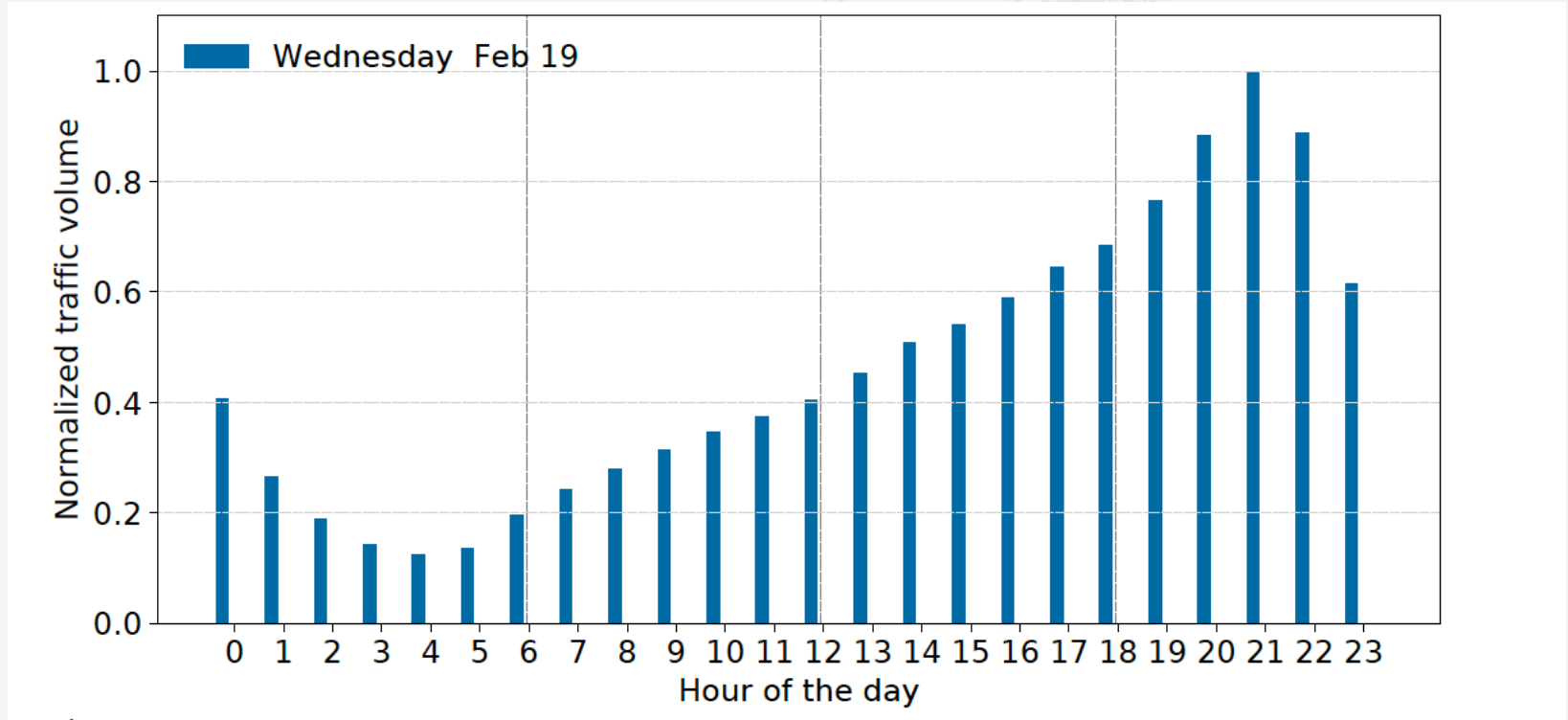
# Traffic changes: January 2019 to June 2020



Once the lockdown started mobile traffic decreased measurably and increased as relaxations started in mid April.

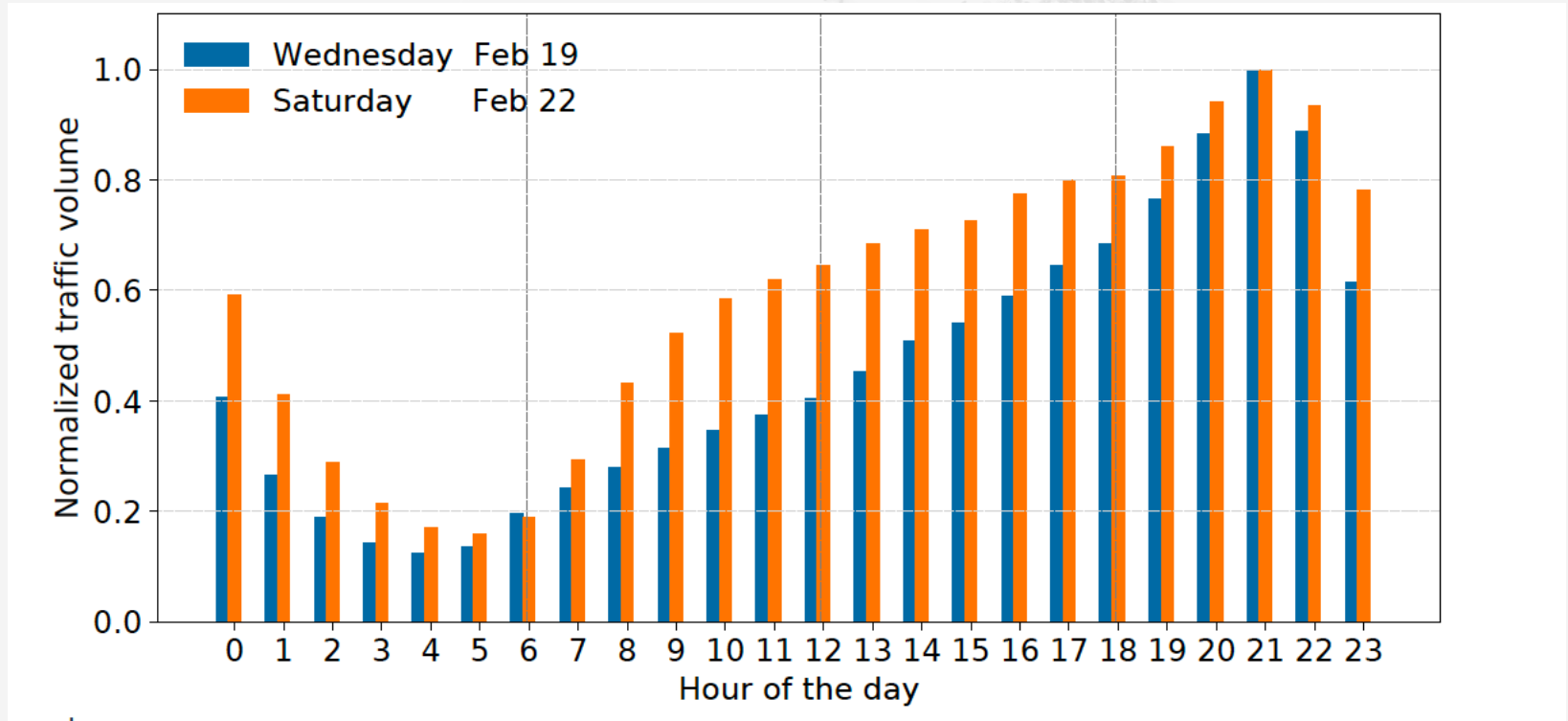


# Changes in workday vs. weekend patterns as seen at ISP



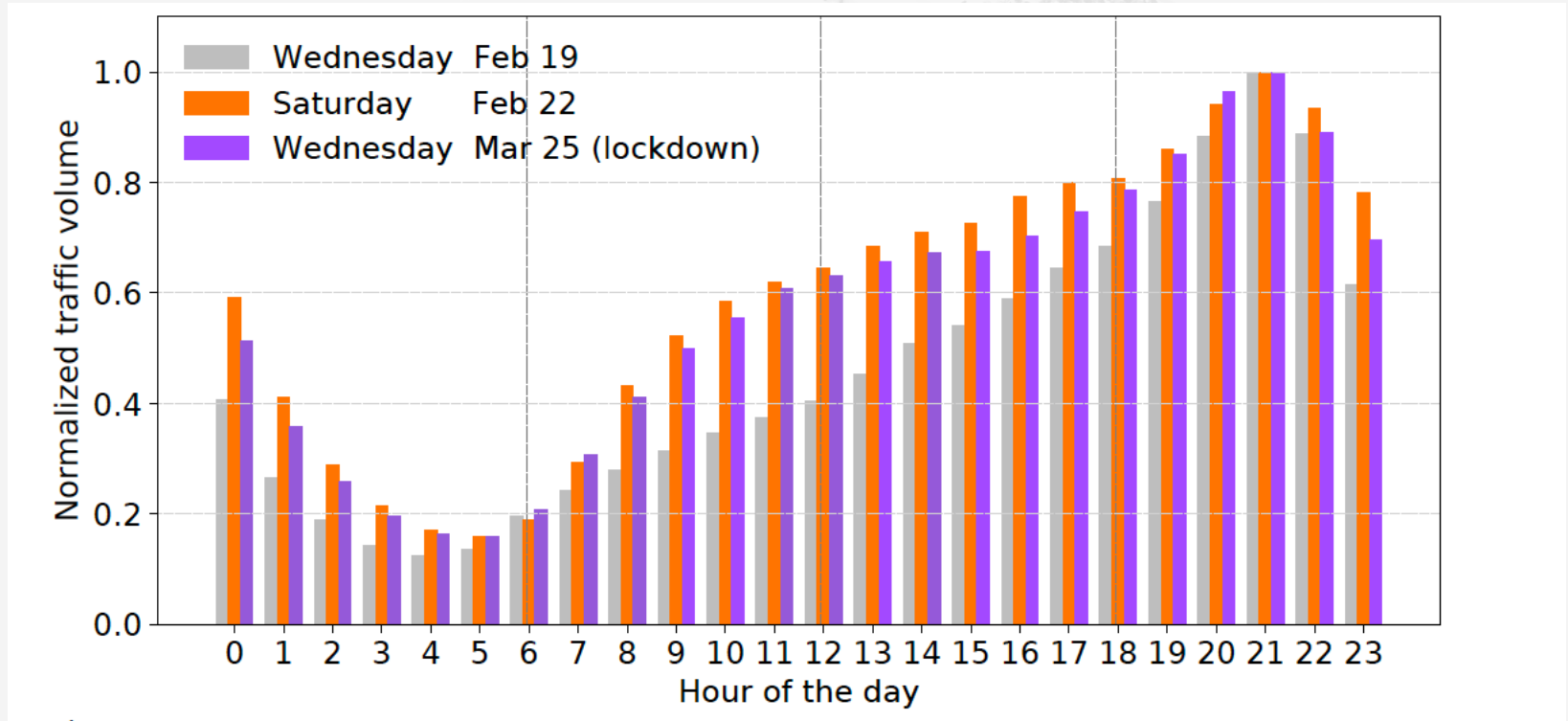
Regular Workday pattern with strong increase in evening hours

# Changes in workday vs. weekend patterns as seen at ISP



Regular Workday vs Weekend pattern - more traffic during daytime on Weekend

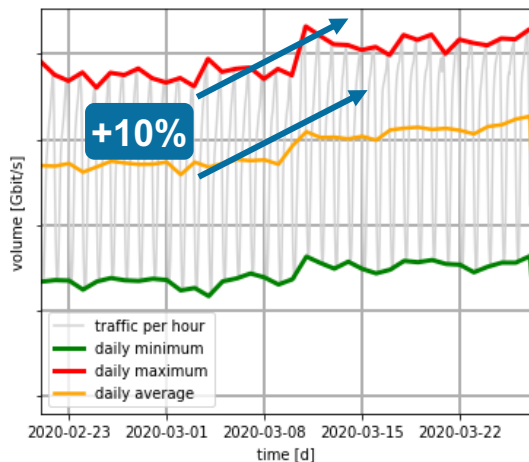
# Changes in workday vs. weekend patterns as seen at ISP



The “Covid” effect – workday pattern looks more like weekend

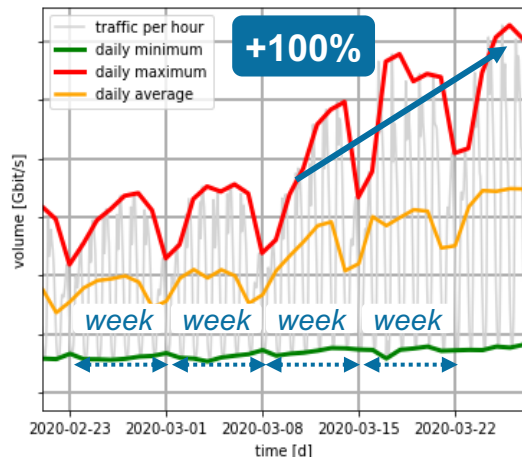
# Traffic patterns @ DE-CIX – example: DE-CIX Frankfurt

## Traffic by volume

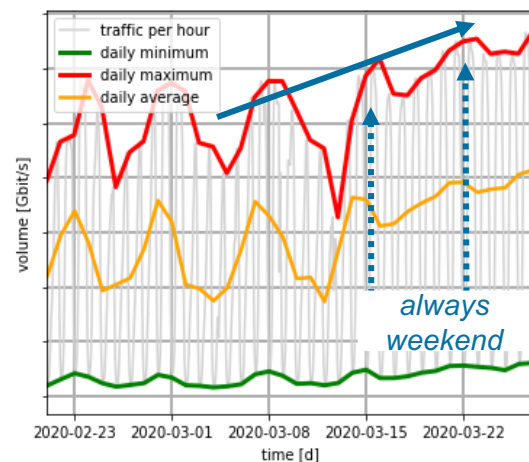


- Traffic increase of 10%

## Collaborative working by volume + a Gaming provider by volume ...



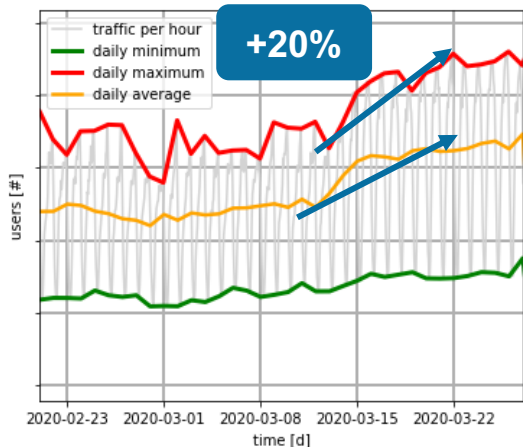
- Collaborative tools (e.g. Skype, Webex, Zoom, Teams...)
- 100% increase in traffic
- More traffic during the week



- A gaming provider with target group of younger people: every day is weekend!

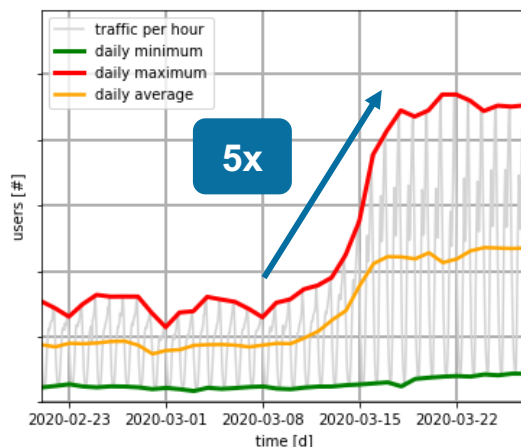
# Traffic patterns @ DE-CIX – example: DE-CIX Madrid

## Total by users



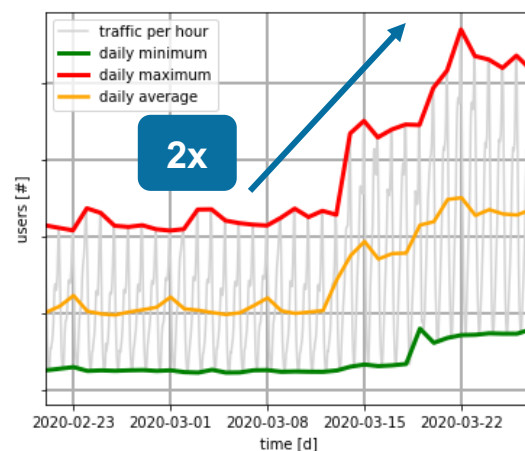
- No. of users (unique IPs)
- About 20% increase

## Collaborative working by users



- Collaborative tools (e.g. Skype, Webex, Zoom, Teams...)
- No. of users grew by factor of 5

## VOD by users



- Video-on-demand services
- No. of users doubled
- Hard to observe weekly patterns anymore

# Possible impacts on the Internet infrastructure

## In the short term

Internet backbone **can absorb fast-growing demand**

Application / use case **specific traffic patterns with “extreme” peaks**

**No strict differentiation between business and residential** usage and networks – uncommon traffic relations

## In the mid to long term

Incremental capacity deployed over a few weeks is **used by newly initiated projects**

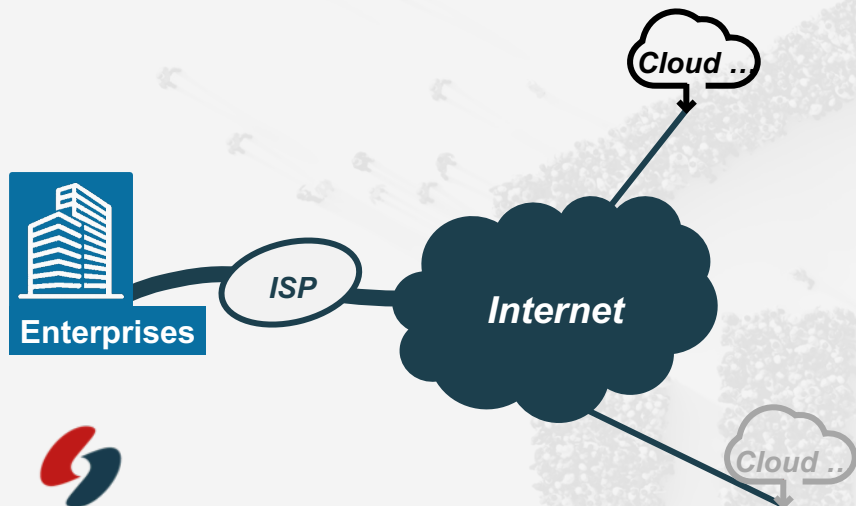
**Shift in traffic patterns** in the Internet, extreme situation a glimpse into the future (?)

Internet architecture must support certain **quality guarantees – multi-services interconnection** (e.g. Cloud)



# The strategic shift ahead we are already anticipating

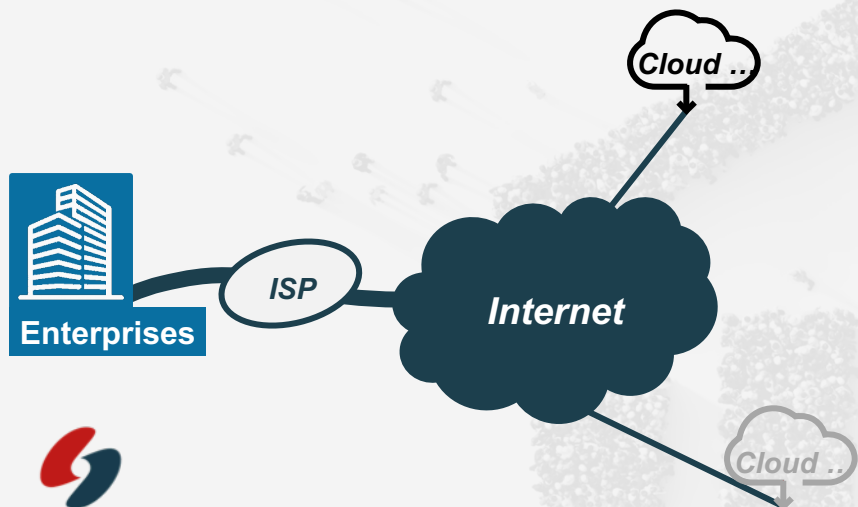
Traditional traffic going to cloud



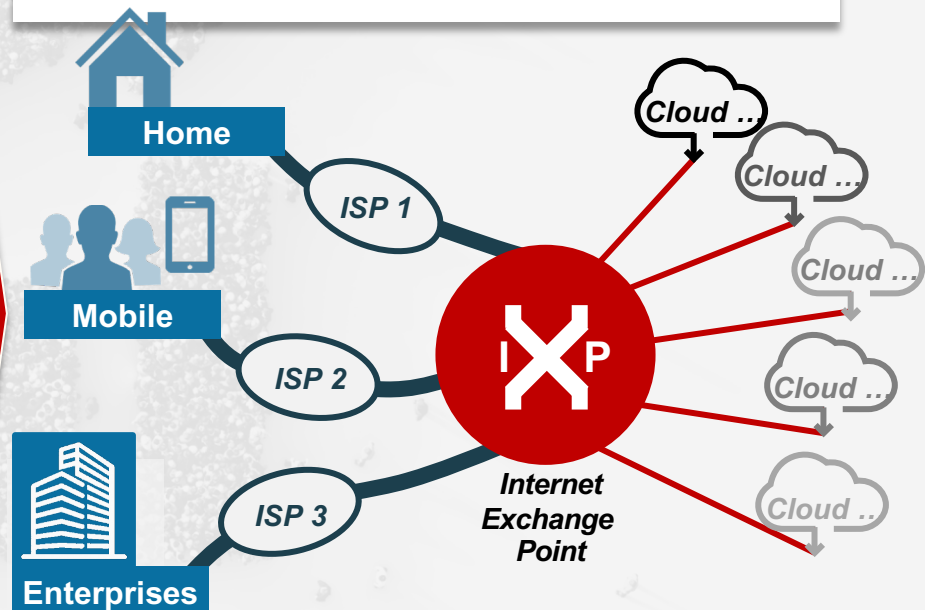
- ▶ No quality guarantee across the Internet
- ▶ No unified access to cloud services

# The strategic shift ahead we are already anticipating

Traditional traffic going to cloud



Shift of distribution of traffic





# *Getting prepared for after the crisis*



DE CIX

*Where networks meet*

[www.de-cix.net](http://www.de-cix.net)

# DE-CIX Business Continuity – Infrastructure

- **Ensuring full security, stability and scalability:**

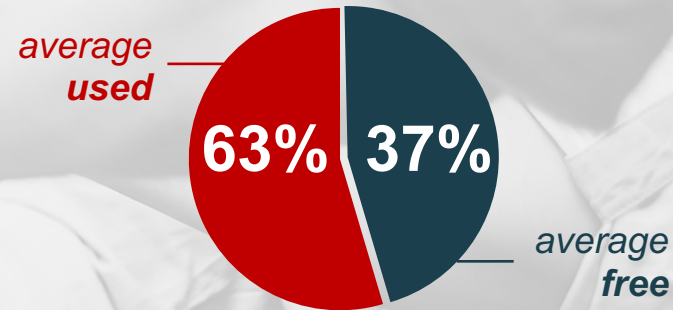
- *ISO Certified 27001*

- *Business Continuity Plan regularly updated & adapted to the situation*

- ➔ *25 years of experience makes a difference now!*

- *DE-CIX platform limitlessly scalable*

- *Average global usage of existing capacity:*



DE CIX

# DE-CIX Business Continuity – Partners & Institutions

- **In permanent contact with partners**
  - *DC partners* to access sites
  - *Carrier partners* to ensure connectivity
  - *Hardware vendors* to secure timely delivery & stocks
- **DE-CIX treated as critical infrastructure worldwide**
  - In contact with different local authorities
  - *Empowerment by local authorities* to guarantee access to our infrastructure



DE CIX

# Elements of a New Deal for the interconnection industry

## Awareness & acceptance

- Across entire society: institutions, citizens, enterprises
- From *explaining* to *doing* (acceleration of project implementations)
- *Digital* on top of *physical* (not instead of)

## Everywhere, everybody, everything

- Global & interconnected (worldwide ecosystem)
- Closer to the edge
- More cloud & content applications
- Interconnection solutions for closed user groups / enterprises



## Easy

- Automation complementing people (API, robot, SDN etc.)
- Sharing (knowledge, open source etc.)
- Self-service (portal)
- Super-flexible. Multi-:
  - . services (off-the-shelves, customized)
  - . scales (capacity, SME to corporate)
  - . providers (neutrality)
  - . channels (in-/direct, self-service)

# *A very special heritage for all providers of digital infrastructure*

- The Internet is needed everywhere, for everybody and everything. Thus, *interconnection infrastructure has to be global, neutral & universal.*
- Interconnection anytime, anywhere, anyhow implies *making it easy. More automation, self-service, openness & neutrality, flexibility* (capacity, partners, one-stop-shop of services).
- Higher *awareness & unquestionable importance* of interconnection infrastructures amongst citizens, governments and enterprises.
- Enterprises & institutions will *accelerate their digital transformation: more cloud, more closed user groups* e.g. health, education.



DE CIX

***Thank you  
& stay healthy!***



# ***Traffic changes: January 2019 to June 2020***

