



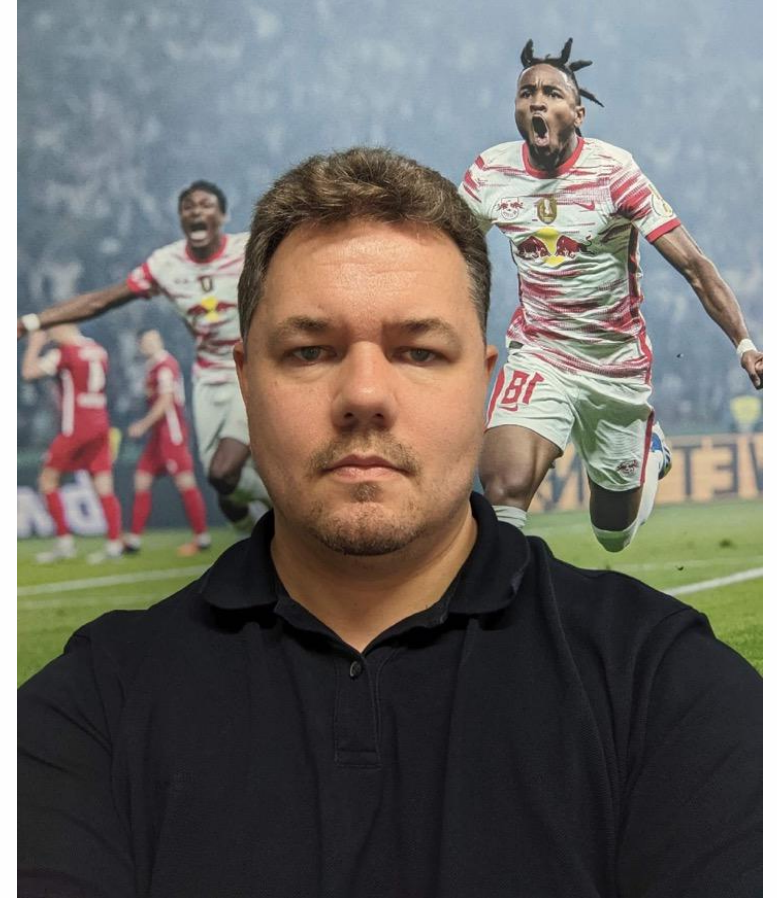
PLAYING GOALKEEPER

Ensuring IT Security for a Bundesliga
Football Club

DIRK SCHWARZ - HEAD OF IT @RB LEIPZIG

ABOUT MYSELF

- ▶ 44 years old, married, 1 child
- ▶ working in the IT industry in several roles since 1998
- ▶ software-developer at heart
- ▶ OpenSource enthusiast
- ▶ working for RBL since April 2020
- ▶ Goalkeeper





WHAT ARE WE
TALKING ABOUT
TODAY?





CONTENT WARNING

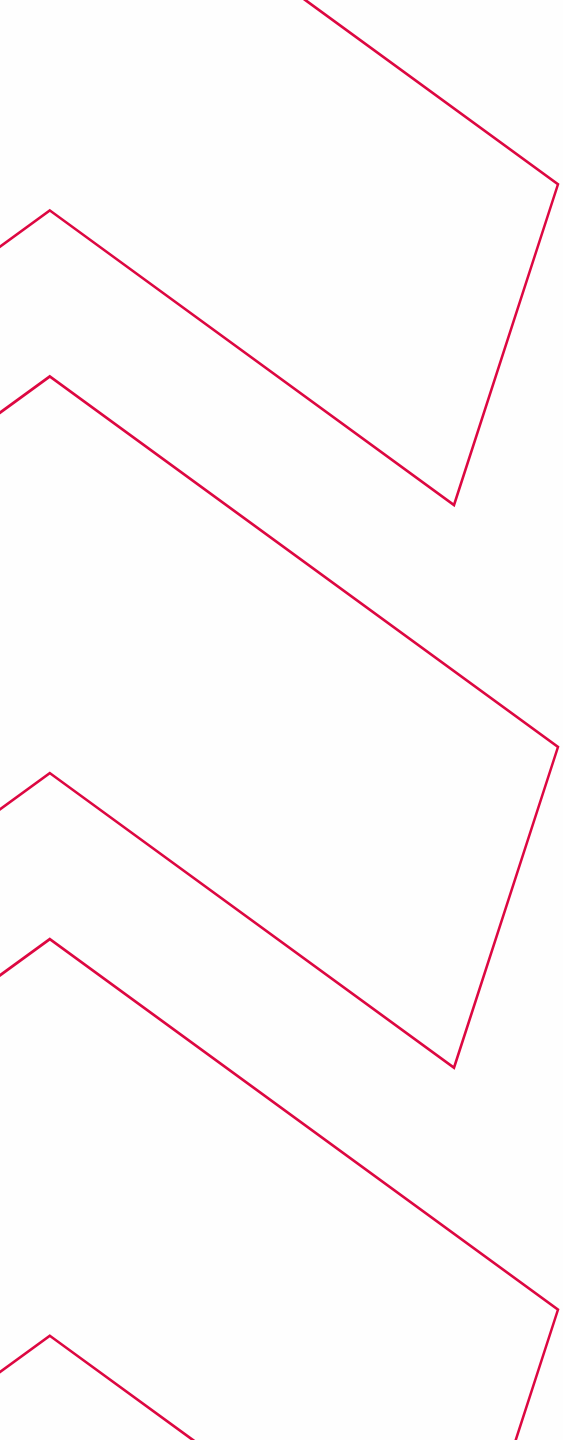


**THIS CONTENT CONTAINS
GRAPHIC DEPICTIONS OF
VIOLENCE THAT MAY BE
DISTURBING OR TRIGGERING
TO SOME INDIVIDUALS.**



1:3





1 FACTS & FIGURES

2 CRITICAL SYSTEMS

3 KEY THREATS

4 MEASURES & PROCESSES

5 ROAD TO EURO 2024

ABOUT RB LEIPZIG

FACTS & FIGURES



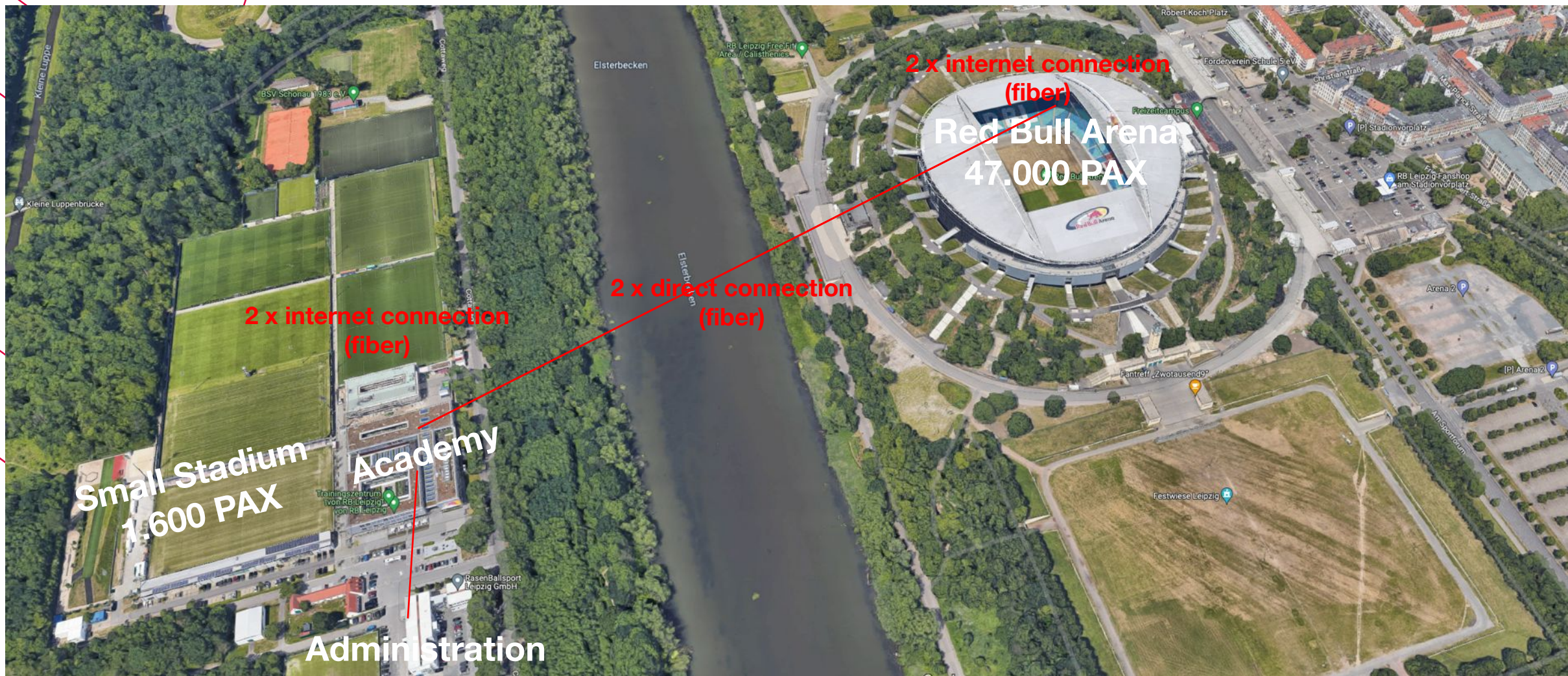
- ▶ founded in 2009, Bundesliga since season 2016/2017
- ▶ DFB Pokal 2022 (German Cup) winner, 4 times finalist within the last 5 years
- ▶ 6 Bundesliga Seasons played (5 6 times qualified for the UEFA Champions League)
- ▶ 2 times winner of the Virtual Bundesliga (2022 + 2023), this year the only German team in the FIFAe Club World Cup

FACTS & FIGURES RB LEIPZIG IT



IT LANDSCAPE

OVERVIEW

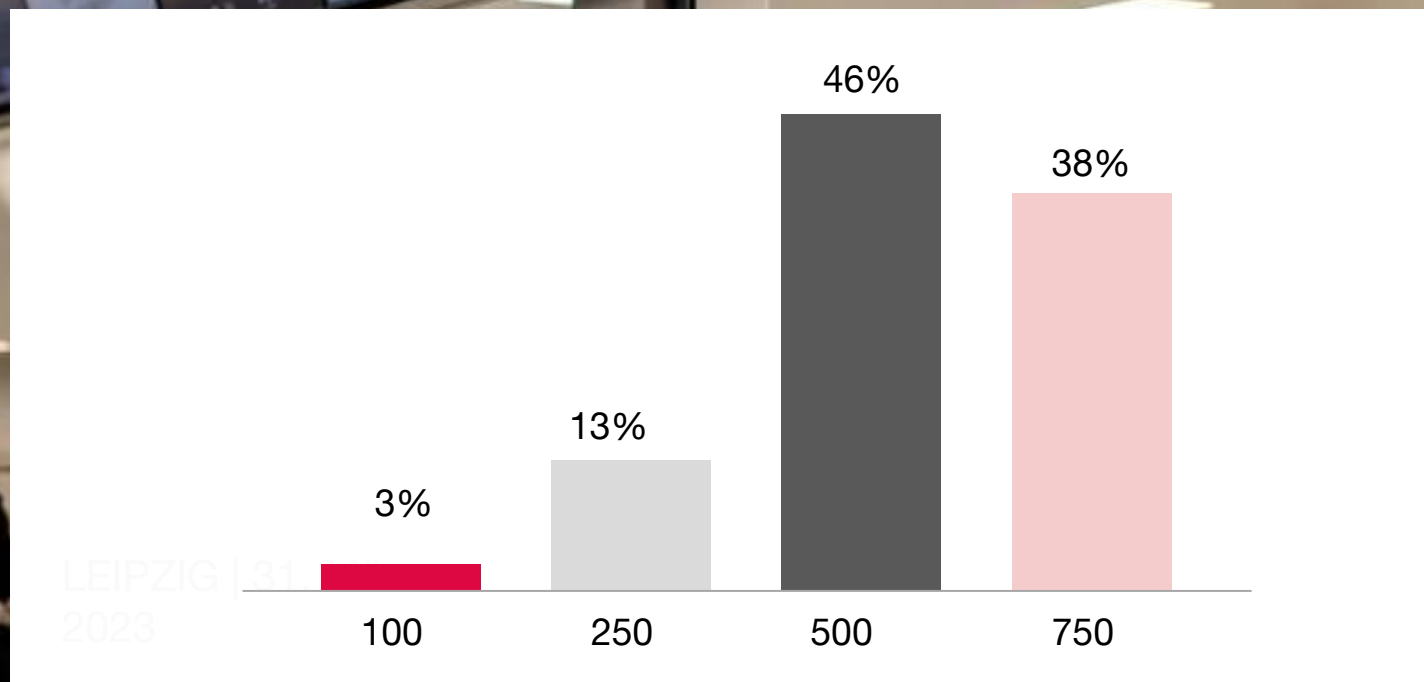


ADMINISTRATION & ACADEMY



- ▶ ~ 450 Workplaces
- ▶ ~ 160 Wi-Fi Access-points
- ▶ ~ 80 Digital Signage Screens
- ▶ 1 big outdoor LED wall

HOW MANY SCREENS ARE IN THE STADIUM? RESULT





RED BULL ARENA

- ~500 Digital Signage Screens
 - ~120 Switches
 - ~110 Wireless APs (non-public)
 - ~40 kilometers of fibre cable
-
- 5 big LED walls
 - 2 Gigant Screens
 - Perimeter & Fascia
 - LED effect-light
 - LED floodlight
-
- ~270 POS for catering
 - ~350 card readers
 - 75 mobile POS for catering
 - ~30 POS for merchandise
-
- ~60 mobile ticket scanners
 - 95 turnstiles for access control
- DIE RÖTEN BULLEN**





CRITICAL SYSTEMS

SYSTEMS CONTAINING DATA



- CRM and CRM related Systems
- HR Systems
- Financial-Systems
- Document-Management
- Corporate Applications
- 1st Team Systems
- Scouting Systems
- Data-Unit Stack



CUSTOMER-FACING SYSTEMS

- Website
- Fan-App
- Ticketing System
 - Match Tickets
 - Car Park Tickets
 - Tickets for other events
- Merchandise Online-Shop
- Kids Club
- Soccer School



MATCHDAY-SYSTEMS

- Floodlight
- Effect-Light
- Sound-System
- POS-Systems
 - Catering
 - Merchandise
- Video Surveillance
- Digital Signage Systems
 - LED Gate
 - LED Walls
 - Perimeter/Fascia-Systems
 - Digital Signage Displays
- Digital Radio System
- LTE/5G Infrastructure
- Turnstiles
- Ticket-App



INFRASTRUCTURE

- Access Control
 - Corporate Office
 - Academy & Training Center
 - Stadium
 - Accreditation-Systems
- Main Data Rooms
- Network Infrastructure
- Power Infrastructure
- Telephony including Service-Center
- Pitch related systems (heating, water)

KEY THREATS





TALKING ABOUT CRITICAL INFRASTRUCTURE IN PUBLIC!?

FLOODLIGHT FAILURE



**WER SPIELT HIER
AM STECKER?**

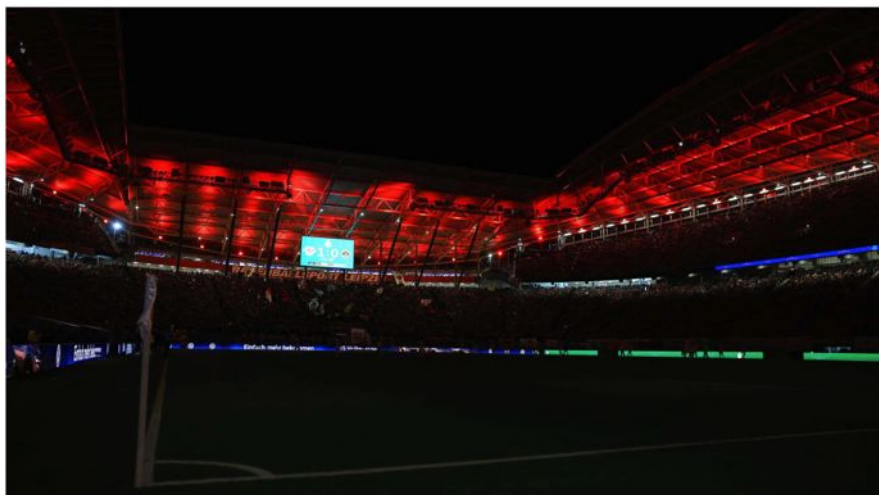
3 MINUTES LATER...

Light broken
Everything dark in the middle of the game

That's why it was completely dark in the stadium.

Bild STARTSEITE NEWS POLITIK REGIO UNTERHALTUNG SPORT FUSSBALL LIFESTYLE RATGEBER SEX & LIEBE AUTO SPIELE DEALS

Darum war es im Stadion plötzlich komplett dunkel



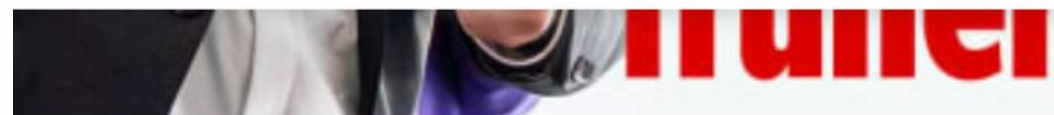
In der 75. Minute fiel in der Leipziger Red Bull-Arena für einige Sekunden das Flutlicht aus
Foto: Jan Woitas/dpa

22:26

LTE 64



MEDIATHEK



DFB-POKAL



RB Leipzig



LIVE - 82.

1:0
(1:0)



Dortmund

BLOCKCHAIN-BASED TICKETING

- ▶ ticket fraud
- ▶ hack/DDoS of the ticketing-system
- ▶ performance issues of the ticket-shop during major sales-phases



FAILURE IN THE STADIUM ACCESS CONTROL

**Tickets suddenly disappeared:
Problems at the entrance before RB
Leipzig's home opener**

Spiel gegen 1. FC Köln

Tickets plötzlich verschwunden: Probleme am Einlass vor Heimauftritt von RB Leipzig



So hatten sich die Fans RB Leipzigs Heimauftritt nicht vorgestellt. Denn noch bevor die Partie gegen Köln angepfiffen wurde, gab es am Einlass Probleme. Viele standen plötzlich ganz ohne Ticket da.

03.11.2021



RB Leipzig
PSG





GENERAL THREATS

- takeover of match-day relevant systems
- steal of sensitive/critical data (personal data, health data, scouting data)
- failure of POS Systems (cashless only)
- website or user-account hack
- account stealing or “orphan” accounts
- DDoS attack on critical systems
- ransomware attacks



MEASURES AND PROCESSES



PROCESSES

regular
(automated)

pen-test

DIE RÖTEN BULLEN



INFRASTRUCTURE

- separation between event infrastructure and corporate network
- redundancy of critical systems and internet connection
- separate, restrictive virtual networks for every kind of system
- monitoring of critical IT-systems



SYSTEMS

SSO

with

MFA

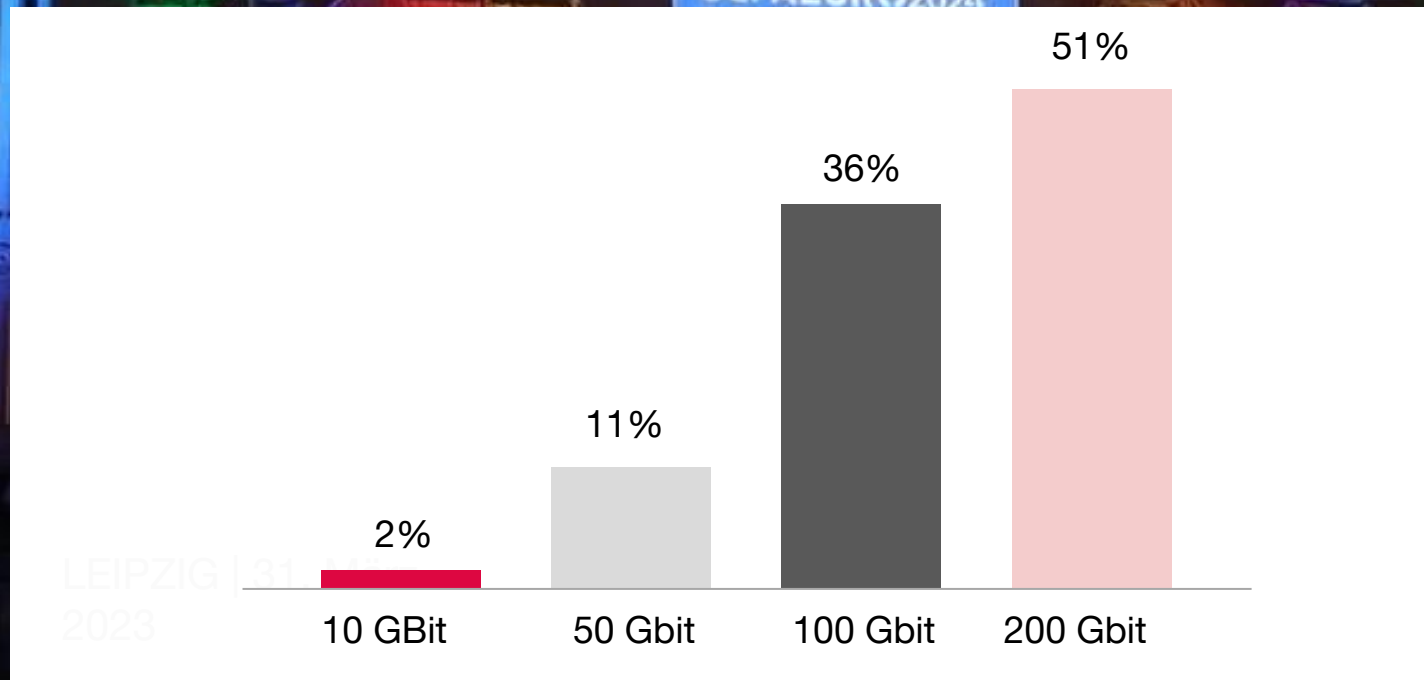
PAM-SV

DRÖT BULLEN

UEFA EURO 2024



WHAT IS THE REQUIRED INTERNET-CONNECTION SPEED FOR THE EURO 2024 Result?





**PREPARATION
EURO 2024**

**first
working-
visit in
Novemb**

THANK YOU!



DIE RÖTEN BULLEN