

“Moin Moin”



Datacenter 2013 - 2018

STULZ

CLIMATE. CUSTOMIZED.

Hamburg – 07.11.2018

TEXT TO BINARY

Red Bull Racing

ENCODE

SELECT TEXT

BINARY TO TEXT

```
01010010
01100101
01100100
00100000
01000010
01110101
01101100
01101100
00100000
```

DECODE

SELECT BINARY

HEX

```
52 65 64 20 42
75 6c 6c 20 52
61 63 69 6e 67
0d 0a 0d 0a
```

DECODE

SELECT HEX

DECIMAL

```
82 101 100 32 66
117 108 108 32 82
97 99 105 110 103
13 10 13 10
```

DECODE

SELECT DEC

agenda

warm - up

- internet in 60 sec
-
- RB / F1
- types of datacenter

cooling

- what`s the deal ?
 - temps & loads
 - Infrastructure
 - worst case & recovery
 - questions & answers
-



44,000,000
MESSAGES PROCESSED
486,000
PHOTOS



26
NEW REVIEWS
POSTED ON YELP

120
NEW ACCOUNTS
OPENED ON
LINKEDIN

MORE THAN
140
SUBMISSIONS
ON REDDIT

MORE THAN
2,315,000
SEARCHES

3,125,000
 243,055



MORE THAN
21,000,000
MESSAGES SENT

70,000
VIDEO MESSAGES
SHARED

MORE THAN
195,000
MINUTES OF AUDIO CHATTING
ON WECHAT



Share
MORE THAN
3,000,000
ITEMS ARE
SHARED

MORE THAN
18,000
MATCHES MADE

972,000
DAILY SWIPES
ON TINDER



MORE THAN
69,500
HOURS OF
VIDEO WATCHED
ON NETFLIX

NETFLIX



MORE THAN
150,000,000
E-MAILS ARE SENT

MORE THAN
48,000
APPS DOWNLOADED
ON IPHONE



GO-Globe
CUSTOM WEB DEVELOPMENT

MORE THAN
95,000
APPS DOWNLOADED
ON ANDROID



MORE THAN
430,000
TWEETS SENT

YouTube



AROUND
56,000
PHOTOS
UPLOADED

9,800
ARTICLES PINNED
ON PINTEREST

MORE THAN
280,000
SNAPS SENT
ON SNAPCHAT

MORE THAN
100
NEW DOMAINS
REGISTERED

MORE THAN
39,300
HOURS OF MUSIC
LISTENED

14 NEW
SONGS ADDED
ON SPOTIFY

MORE THAN
2,700,000
VIDEO VIEWS AND
139,000 HOURS
OF VIDEO WATCHED

MORE THAN
300 HOURS
OF VIDEO ARE
UPLOADED



Objective

- Red Bull F1 approached STULZ-TI to look at redesigning a rack solution (Micro DC) for track side applications, the problem is the track is a very hostile environment due to graphite dust off the brakes, rubber from tyres, general dust from the track and it can get up to 45C 95% Humidity in the garage
- Client was changing his IT Hardware every 2 races due to ingress of dirt/debris at a cost of £1.2M

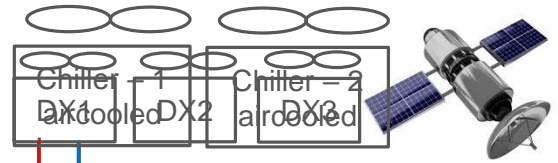


Solution

- STULZ-TI Came up with a bespoke Micro Data Centre consisting of 3 racks and 2 X 20KW AC units for the Race team and 1 rack 1 20KW AC for Test Team (trigonometry)
- The units were installed in the first race of 2017 in Australia and they have gone to every race this season (total of 20) and still using the same IT Hardware. Saving to Red Bull of £24M
- Red Bull have just ordered 10 x sets for 2018 season



redundancy n + 1



latency < 0.1s / 360°

18410A
 $Q_0 = 50-60 \text{ kW}$

+ X Y Z



...001101000...



savings - result

• £ 24M / 2018

• (- 0.8 s / lap)

types of datacenter

a typical Datacenter sorry, not available !.... 1 - ∞

Hyperscale



“streaming“ – requires “edge“
Micro DC – “local“ (max. 50kW)

GE-Systems

technical standards &
specifications

DIN EN 50600, etc.

customized products,
“off script“, etc.

Co-Lo(cation)

Level(3)[®]



DIGITAL REALTY



EQUINIX

GLOBAL
SWITCH

types of datacenter

Hyperscale

(yes) / no

individual

32 - 20°C

20....27°C



~ 400 kW

~ 15 kW/rack

trends

raised floor

availability

CHW – temps

supply air

CRAH – size

load

Co-Lo

yes / (no)

high / very high

18/12 – 21/14°C

18....24°C



~ 123 kW

~ 5 kW/rack



infrastructure



1.000 kW – ΔT 6K (EG30) – $\sim 150 \text{ m}^3/\text{h}$

downtime - 10 min



buffertank - 25 m^3

$\varnothing \times h$ — 1 : 3 — $2,2 \times 6,6 \text{ m}$



10.000 kW — 10 min — $\sim 250 \text{ m}^3$

questions & answers

special offer – TODAY – 25.10.2017



52€50 per 5 questions



“Tschüss”

