# APOLLON

DE-CIX APOLLON. CUTTING EDGE INTERCONNECTION.


apollon.de-cix.net

# DE-CIX Apollon

# How to scale a big Internet Exchange

DENOG 5

November 14th, 2013

Daniel Melzer

daniel.melzer@de-cix.net

DE·CIX

**Press Release**

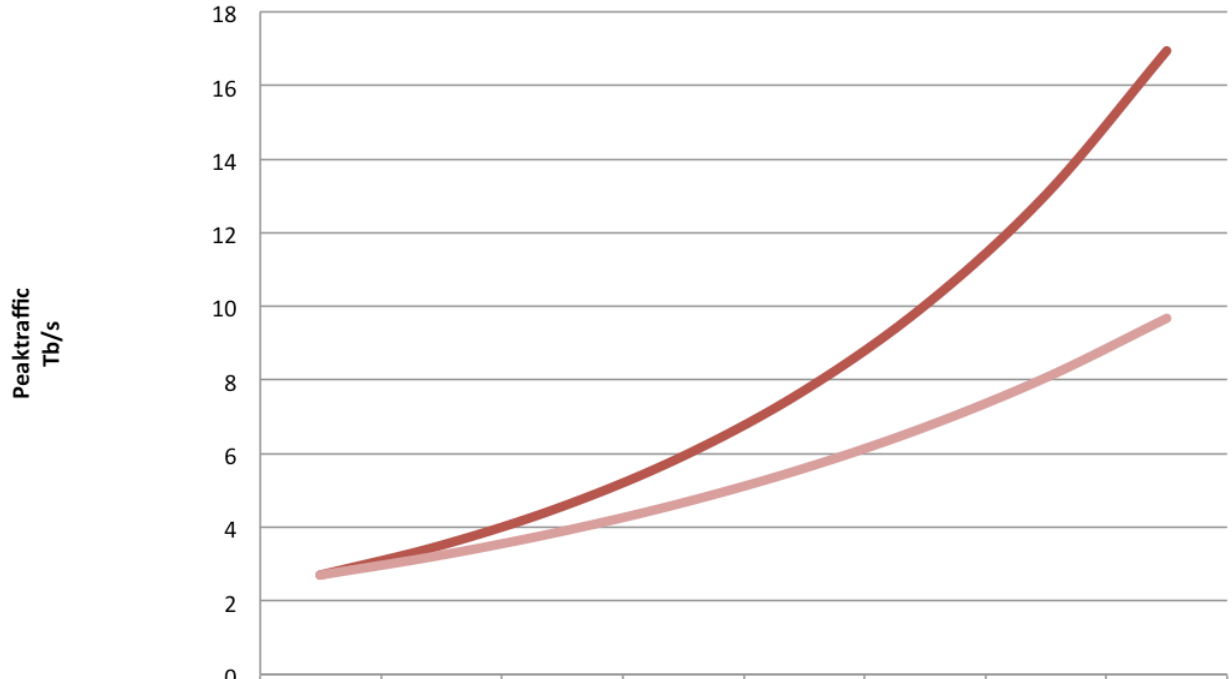
New data throughput peak at DE-CIX Internet exchange point in Frankfurt

# Data traffic at DE-CIX reaches new peak value of 10 terabits per second

***November 14, 2018***

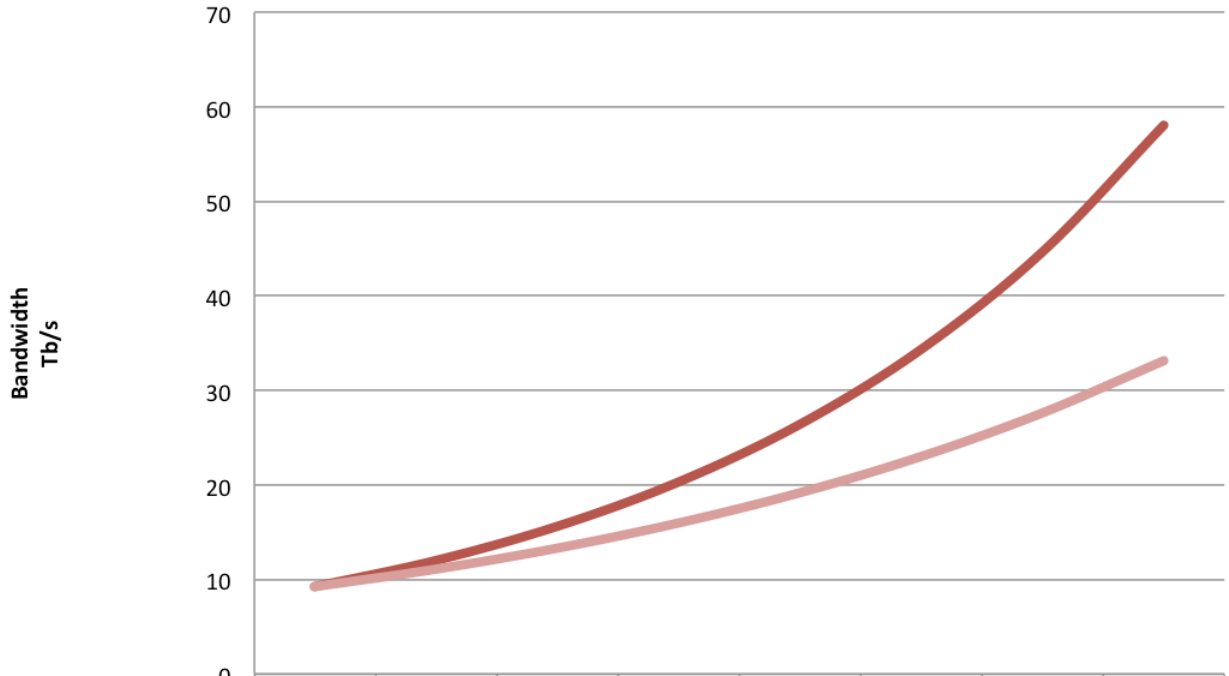
DE-CIX, the world's largest Internet exchange, located in Frankfurt am Main (Germany), has achieved a new data throughput record: Internet traffic at DE-CIX exceeded the 10 Tbit/s (terabits per second) mark for the first time ever. More than 900 Internet service providers from over 60 countries are currently connected to the Internet exchange, bringing the Net and its content to millions of households around the globe. "Although

## Peaktraffic @ DE-CIX



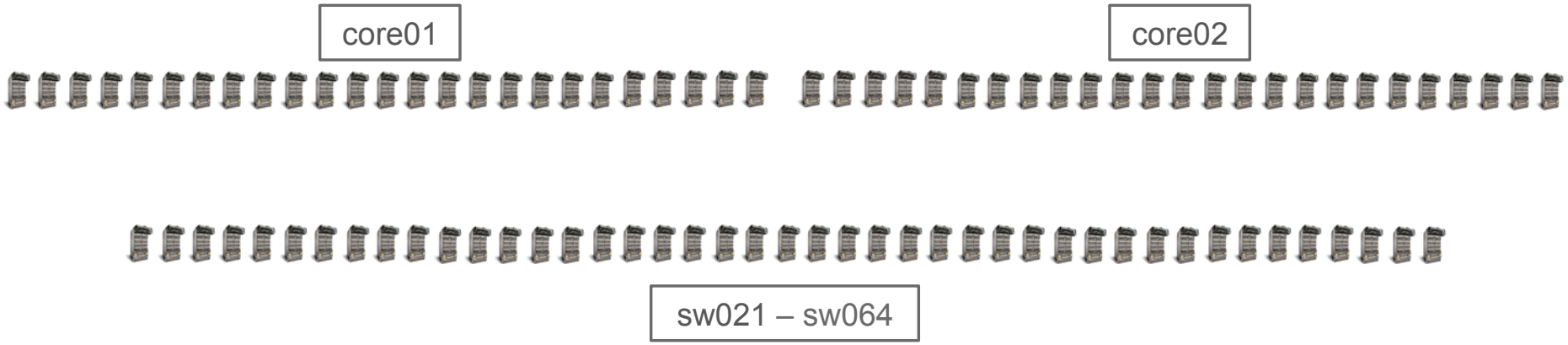

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|
| 30% Growth p.a. | 2,7 | 3,5 | 4,6 | 5,9 | 7,7 | 10,0 | 13,0 | 16,9 |
| 20% Growth p.a. | 2,7 | 3,2 | 3,9 | 4,7 | 5,6 | 6,7 | 8,1 | 9,7 |

## Connected customer bandwidth @ DE-CIX




| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|
| 30% growth p.a. | 9,2 | 12,0 | 15,6 | 20,3 | 26,4 | 34,3 | 44,6 | 58,0 |
| 20% growth p.a. | 9,2 | 11,1 | 13,3 | 16,0 | 19,2 | 23,0 | 27,6 | 33,1 |

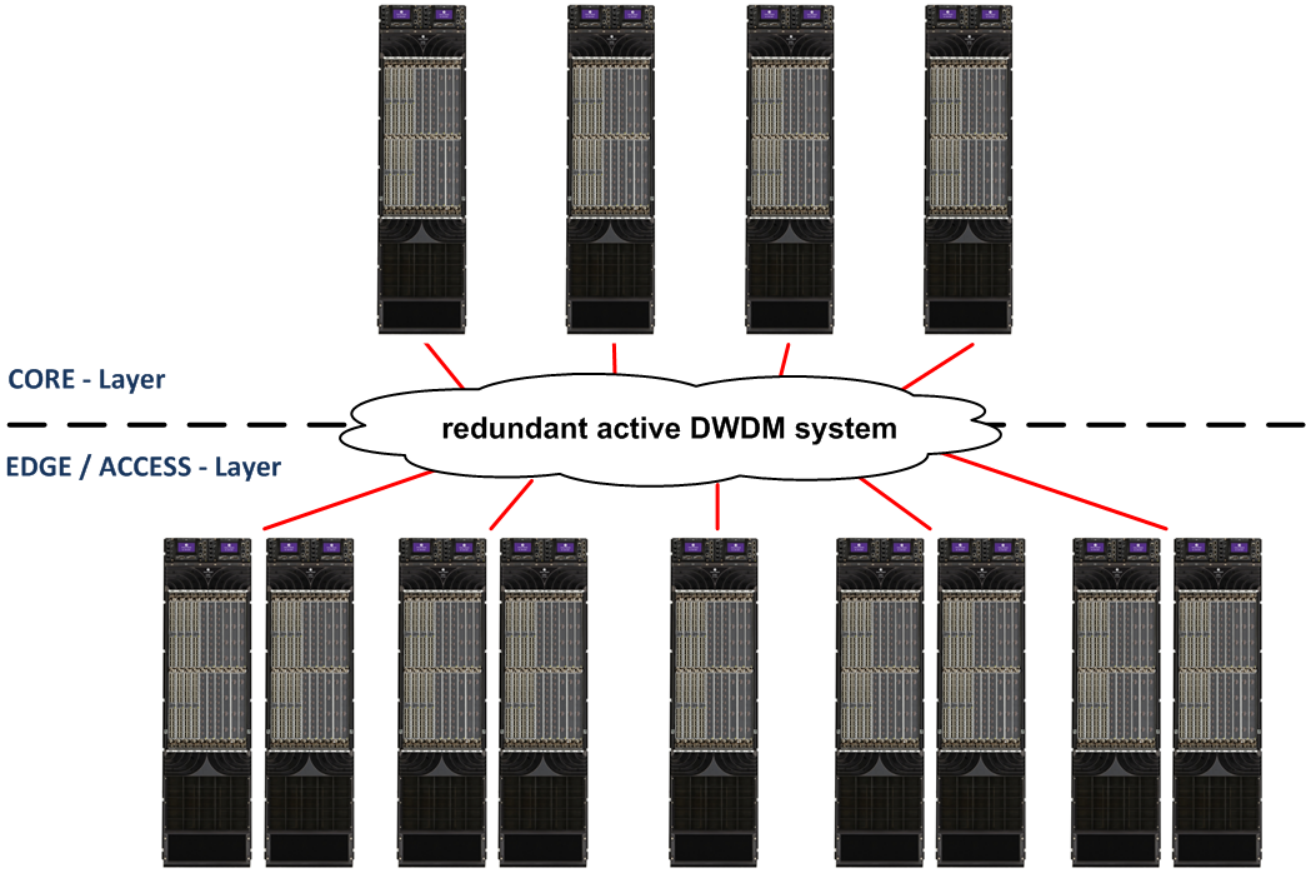
# DE-CIX topology 2018
# based on old design and hardware



# Conclusion

- Old setup doesn‘t scale in terms of
  - Port density
  - Power
  - Space
  - Core scaling (Multi-Pathing)
  - Link management
  - Local switching
- **Something new is needed**

# DE-CIX topology 2018
# based on new design and hardware



Questions?

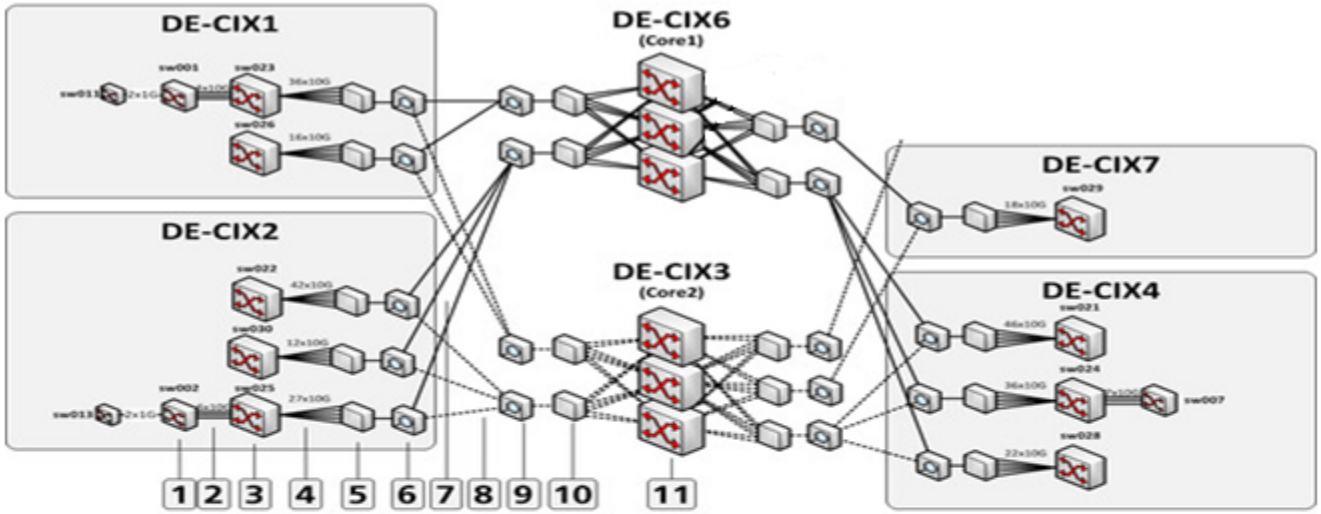
DE-CIX Competence Center
Lindleystrasse 12
60314 Frankfurt
Germany

Phone +49 69 1730 902 - 0
info@de-cix.net


DE-CIX Competence Center @
Kontorhaus Building

Frankfurt Osthafen (Docklands)

- Status Quo DE-CIX Network Topology




1 Force10 Terascale E1200
2 Multiple 10G-Connections
3 Force10 Exascale E1200i
4 Multiple 10G-Connections
5 DWDM MUX 32 Channel
6 Lynx LightLeader Master Unit
7 Dark Fiber Working Line
8 Dark Fiber Protection Line
9 Lynx LightLeader Slave Unit
10 DWDM MUX 32 Channel
11 2xBrocade MLX32 and 1xForce10 Exascale 1200i per Core

- Platform – Status Quo
  - Current access-switches (F10 ExaScale E1200i) allow max. ~80 customer ports (10GE), no100GE possible
  - No LACP for backbone connections, no link monitoring BFD
  - MAC learning issues on the core switches
  - 1:1 redundancy  in the core – 3 core switches doing nothing at the time
  - No multipathing via multiple core switches
  - In case of failover about 400 x 10GE connections are switched simultaneously and need to work immediately – testing beforehand not possible
  - Monitoring of backup links also not possible
  - 5% light on backup links via LightLeader has unwanted side effects on bacukp cores
  - Reseller ports only via hardware looping

- Goals
  - DE-CIX Apollon will provide cutting edge interconnection on a 100GE level by choosing and implementing new infrastructure for both the optical layer and the switching layer.
  - Apollon needs to support traffic and customer port growth for the next 3-5 years. This includes scalable capacity in the core of up to 20Tbps in 2016 and 45 Tbps in 2018.
  - Replace 1:1 redundancy in the core with n+1 redundancy.
  - Keep local traffic local (switch and site).
  - Core links must be 100GE to reduce the number of links, to better utilize bandwidth, and to be able to accommodate larger flows.
  - Redundancy and multipathing on upper protocol layers.

- New Topology (snapshot)