CTNDCI: Identifying the Challenges Towards a distributed Nano Data Center Infrastructure

Melanie Hauser
Ludwig Maximilian University of Munich
Munich, Germany
melanie.hauser@campus.lmu.de

Diana Irmscher
Ludwig Maximilian University of Munich
Germany
d.irmscher@campus.lmu.de

Mengchu Li
Ludwig Maximilian University of Munich
Munich, Germany
mengchu.li@yahoo.com

Katrin Kolb
Ludwig Maximilian University of Munich
Munich, Germany
Katrin.Kolb@campus.lmu.de

Katharina Rupp
Ludwig Maximilian University of Munich
Munich, Germany
katharina.rupp@web.de

Andreas Scholz
Ludwig Maximilian University of Munich
Germany, Germany
andreas.scholz@campus.lmu.de

Document Identifier: GI 201711

ABSTRACT

In this paper we identify the challenges currently preventing nano data centers from becoming the dominant form of content provision on the internet. With the global increase in IP traffic the question of how to provide and deliver data is becoming increasingly important. Monolithic data centers, as they are used today, pose several problems, such as high energy consumption and lack of scalability.

SPWAL LMU, November 2017, Munich, Germany

An alternative solution mitigating the problems of monolithic data centers has been proposed in the form of a distributed nano data center infrastructure. Research has shown this to be a superior solution. However, no widespread solution based on a nano data center infrastructure has been implemented as of yet. By identifying the main challenges nano data centers are facing steps can be taken to overcome these challenges in a more focused way, leading to a more economic data distribution.
Author: Andreas Scholz

KEYWORDS

Green IT; Nano data center; Energy consumption; Security; Availability; Scalability; Data distribution

ACM Reference Format:
Melanie Hauser, Diana Irmscher, Mengchu Li, Katrin Kolb, Katharina Rupp, Andreas Scholz, and Document Identifier: GI 201711. 2017. CTNDCI: Identifying the Challenges Towards a distributed Nano Data Center Infrastructure. In *Proceedings of Wissenschaftliches Arbeiten und Lehren, LMU (SPWAL LMU).* ACM, New York, NY, USA, 2 pages. https://doi.org/10.1145/nnnnnnn.nnnnnnn

SPWAL Research Project: Green Computing
Title: Identifying the Challenges Towards a distributed Nano Data Center Infrastructure
Progress Report I

ACHIEVEMENTS

NEXT TEPS

DEVIATION FROM PLAN

REFERENCES

[1] Inc. Cisco Systems. 2017. The Zettabyte Era: Trends and Analysis - Cisco. (07 2017). https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/vni-hyperconnectivity-wp.html#_Toc484556821 (Accessed on 11/05/2017).

[2] D. Dumitriu, E. Knightly, A. Kuzmanovic, I. Stoica, and W. Zwaenepoel. 2005. Denial-of-Service Resilience in Peer-to-Peer File Sharing Systems, Vol. 33. ACM. https://doi.org/10.1145/1071690.1064218

[3] Fatemeh Jalali, Robert Ayre, Arun Vishwanath, Kerry Hinton, Tansu Alpcan, and Rodney S. Tucker. 2014. Energy Consumption of Content Distribution from Nano Data Centers versus Centralized Data Centers. *SIGMETRICS Performance Evaluation Review* 42 (2014), 49–54.

[4] Nikolaos Laoutaris, Pablo Rodriguez, and Laurent Massoulie. 2008. ECHOS: Edge Capacity Hosting Overlays of Nano Data Centers. *SIGCOMM Comput. Commun. Rev.* 38 (Jan. 2008), 51–54. https://doi.org/10.1145/1341431.1341442

[5] Darshan Mhapasekar. 2011. Accomplishing anonymity in peer to peer network. ACM. https://doi.org/10.1145/1947940.1948055

[6] Vytautas Valancius, Nikolaos Laoutaris, Laurent Massoulié, Christophe Diot, and Pablo Rodriguez. 2009. Greening the internet with nano data centers. In *CoNEXT*. ACM, 37–48.