

UbuntuNet CONNECT | 2017

Contribution ID: 56

Type: **Reviewed Presentation**

Facilitating content distribution in Sub-Saharan Africa through Software-Defined Exchange Points

Friday 3 November 2017 08:00 (20 minutes)

Sub-Saharan Africa is the fastest growing region of international Internet capacity in the world. Content in Sub-Saharan Africa is increasing: Microsoft is bringing two new data centers to South Africa, and Google and Akamai have been installing caches. The demand for content distribution within Sub-Saharan Africa is growing as the number of data centers and caches increase. Strategic placement of local compute, storage and networking is increasingly important in response to demands in local content distribution growth.

Internet eXchange Points (IXPs) are resources that play a central role in interconnecting many networks. In addition, their role has been expanding in importance for bringing content closer to end users. For example, as content traffic continues to rise, IXPs are in the foreground of the peering issues between content providers and access networks. IXPs are considered a natural resource to evolve into a SDX, because they offer a physical location where multiple networks meet to exchange traffic and to peer (exchange routes).

This paper presents a Software-Defined Exchange as a novel internetworking paradigm to facilitate content distribution. A SDX facilitates sharing of compute, storage and networking resources among multiple independent administrative domains, such as ISPs, CDNs, or NRENs. A survey of the most relevant SDX studies and use cases for a SDX, including content distribution, will be presented. Finally, deployment considerations and projects implementing SDXs will be discussed.

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Session Classification: Session 4a - Tools and e-Infrastructure required for Intra-African Collaboration

Track Classification: Technical support required for intra-African collaboration