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The Next Generation University Campus Network : Design Challenges & Opportunities

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The University of Jammu is a very big regional University having 7 Campuses which are separated by 400 kilometers. Managing network connectivity is a big challenge. The existing network was setup in 2004 and now the user requirements especially due to the present scenario of pandemic as well as ONLINE classes as well as work from home scenario makes it a challenge.

With the emergence of New Campus Network Paradigm and advancement in Technology augmented with Big Data as well as Artificial Intelligence, it is of at most importance realizing an infrastructure suitable for emerging Campus workloads.

The Next Generation Campus Network must be designed focused on key parameters such as Automation, Scalability, open standard, security. It must have a balance between LAN and WI-FI in such a way that the availability and usage of the internet bandwidth is optimized. Also, the seven geographically diverse campuses must be seamlessly integrated. Jammu being in one of the most sensitive areas of India, security of the network, its resources and users has also to be taken care of.

The paper will discuss the key performance indicator for deciding the architecture as per the required workload in campus network. A qualitative analysis of existing technology and roadmap will be discussed with use cases. Network Virtualization techniques such as VxLAN-EVPN for Campus Network will evaluated with use cases over legacy campus Network design.

The paper proposes to evolve a framework that shall support selection of best suited architecture and associated protocols from lowest level to highest level but also try to optimize the operation in such a way so as to strike a balance between performance key indicators for a campus network. The proposed framework would in addition, attempt to meet the end user SLAs, which take care of Quality of Service, availability and other parameter of significance. Consequently, this would involve achieving the desired degree of cohesion between involved entities.

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