Case ID:M16-091P

Published: 10/18/2016

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Layered SDN Backhaul Architecture (LayBack) for the Small Cells

Backhaul access networks bridge telecommunications devices to core networks that provide internet, but have bottlenecking concerns due to insufficient bandwidth (rate of data transfer). Though networks that provide connectivity (i.e. Radio Access Networks, RANs) and core networks are able to handle large streaming capacities, backhaul networks require costly equipment with proprietary software and thus, have delayed advancements in technology. Therefore, researchers are now looking to design an improved system architecture that reduces signal load and enables technological progress of backhaul networks.

Researchers at ASU have developed a backhaul network architecture based on software-defined networking (SDN) that reduces signal load and enables upgrades to technology. The backhaul network uses a novel handover protocol that duplicates and forwards network traffic information in a way that relieves backhaul bottlenecking. Additionally, the architecture decouples the wireless RAN (i.e. LTE, WiFi) from the backhaul, which allows for both future improvements and control of the individual network components. Further, it is fully compatible with current technologies and as a result, removes the need to replace the entire framework, providing substantial efficiency improvements at a low cost. Overall, the network architecture utilizes a unique handover protocol that permits function with current devices, reduces bottlenecking, and allows for future improvements that result in a low-cost and efficient network.

Potential Applications

- Telecommunication and Wireless Service Providers
- Backhaul Architectures for Wireless Networks
- Interference, Communication, and Video Streaming Handover Protocol

Benefits and Advantages

- Low Cost – The architecture allows function with current devices instead of replacing the entire framework
- Effective – The handover protocol quickens the overall rate of data transfer by reducing bottlenecking at the backhaul by making it independent of the RAN, allowing individual control of the various network components
- Innovative – Separate control of the network components permits future advancements of them, preparing for simple adaptations of future technology

For more information about the inventor(s) and their research, please see:

Dr. Martin Reisslein's directory webpage