ON SUPPORTING MULTI-HOP MOBILE COMMUNICATIONS FOR VIRTUAL BRIDGED LOCAL AREA NETWORKS

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ABSTRACT

ONE OF THE MOST ATTRACTIVE FEATURES OF THE VIRTUAL LOCAL AREA NETWORK (VLAN) IS THE CAPA -BILITY TO GROUP USERS FROM DIFFERENT PHYSICAL LAN SEGMENTS INTO A SINGLE BROADCAST DOMAIN. VLANS, THUS, FACILITATE EASY ADMINISTRATION OF LOGICAL GROUPS OF STATIONS THAT CAN COMMUNI -CATE AS IF THEY WERE ON THE SAME LAN. IN ADDITION, TRAFFIC BETWEEN VLANS IS RESTRICTED.TH -IS IN TURN LIMITS THE PROPAGATION OF MULTICAST AND BROADCAST TRAFFIC BETWEEN VLANS. THESE TWO FEATURES MAKE THE VLAN MORE REWARDING IN A WIRELESS ENVIRONMENT WHERE THE BANDWIDTH IS QUITE LIMITED AND CONSTANT MOVING OF THE MOBILE STATIONS ARE HIGHLY ANTICIPATED.IN THIS PA -PER,WE EXPLORE THE POSSIBILITY OF COMBINING THE CONCEPT OF MULTI-HOP WIRELESS TECHNIQUE W -ITH THE VLAN TO EXTEND THE VLAN SCOPE TOWARD THE ALWAYS ON" NETWORK ENVIRONMENT,INCLUDING AREA WHERE THERE IS LITTLE/NO COMMUNICATION INFRASTRUCTURE, OR THE EXISTING INFRASTRUCTURE IS DAMAGED AFTER A HURRICANE OR EARTHQUAKE. FOR SUPPORTING SUCH AN INTEGRATION OF AD HOC N -ETWORKS WITH MOBILE VLAN (MVLAN), WE PRESENT IN THIS PAPER THE DESIGN OF MULTI-HOP MVLAN MEMBER TRACKING MECHANISM AND THE FRAME FORWARDING PROTOCOL.IN SUMMARY,THE ACHIEVEMENT OF MULTI-HOP MVLAN IS TWOFOLD. FIRST, THROUGH THE MVLAN TECHNIQUE, THE TRANSPARENT HANDOFF OF MOBILE STATIONS CAN BE ACHIEVED AND THE NETWORK BANDWIDTH CAN BE EFFICIENTLY AND EFFECTIVE -LY UTILIZED.SECOND, THROUGH THE AD HOC NETWORKING TECHNIQUE, THE VLAN SCOPE CAN BE SCALED TO INCLUDE AREAS WHERE THE COMMUNICATION INFRASTRUCTURE IS INSUFFICIENT.

Keywords : VIRTUAL LOCAL AREA NETWORK (VLAN), WIRELESS LAN (WLAN), MULTI-HOP, AD HOC NETWORK., MOBILE VLAN (MVLAN).

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