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Efficient Management of Fast Handoff in Wireless Network Mobility (NEMO)

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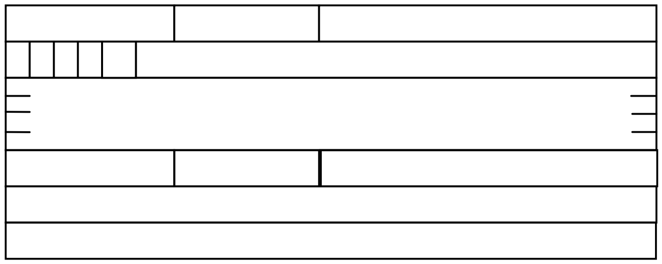
Abstract **Fast handoff in network mobility (NEMO) is very crucial for providing uninterrupted Internet services to the users in quickly moving vehicles. However, the NEMO basic support (NBS) protocol takes comparatively long time to complete the handoff process resulting in large number of packet drops. In this paper, we propose fast NEMO (FNEMO) to reduce the handoff latency and packet losses experienced in NBS protocol. FNEMO brings in the concept of IP pre-fetching and advance-registration to acquire care-of-address for the anticipated future cells. Numerical analysis shows that FNEMO can support higher vehicle speed than that in fast MIPv6 (FMIPv6) and still has significantly low signaling overhead.**

Keywords- Network Mobility, MIPv4, MIPv6, FMIPv6, fast handoff.

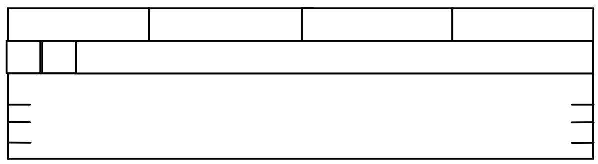
I. INTRODUCTION

In recent years, providing seamless Internet connectivity to the passengers of fast moving vehicles (e.g., trains, buses etc) has become an active research area [1]-[5]. A vehicle may contain a large number of mobile nodes (MN) forming a network. When the vehicle moves, all MNs in the network move as a single unit, which is referred to as network mobility (NEMO) [2]. The terminal mobility protoc aotoci

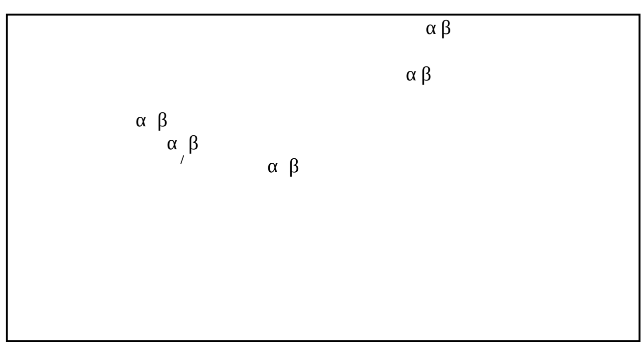
A. Fast handoff for terminal mobility



B.2 Deregistration



B.3 IP pre-fetching and advance-registration



V_{max}

$$x \quad r \qquad \frac{c \quad r \quad c}{r}$$

$$c \quad -r$$

$$d_h \quad \underline{d} \quad \frac{\frac{h}{k}}{\frac{h}{k}}$$

T

$$r \quad x \quad \frac{x}{} \quad d_h$$

$$| \quad |$$

t

$$t \quad T \quad m \quad n$$

$$V \qquad \frac{|GK|}{t}$$

$|GK| \quad t$

$$V \qquad \frac{r \quad - x \quad \frac{d}{} \quad \frac{\frac{h}{k}}{\frac{h}{k}}}{T \quad m \quad n}$$

$$W_{max}$$

$$z \quad \frac{x}{} \quad d_h$$

$$\frac{x}{} \quad \frac{d}{} \quad \frac{\frac{h}{k}}{\frac{h}{k}}$$

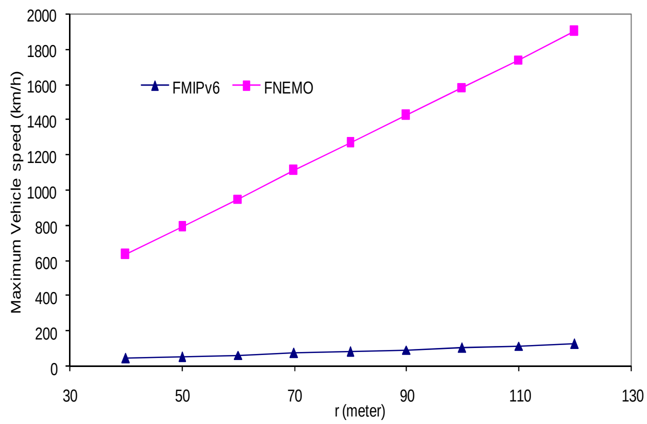
t

$t \quad m \qquad m \qquad m \qquad n \qquad n \qquad m$

$$t \quad m \quad n$$

$$\frac{}{t}$$

$$\frac{\frac{x}{} \quad \frac{d}{} \quad \frac{\frac{h}{k}}{\frac{h}{k}}}{m \quad n}$$



T_{FMIPv6} T_{FNEMO}

T_{FMIPv6} W_{max}

W_{max} $\frac{z}{m}$ T_{FMIPv6}

C_{FMIPv6} C_{FNEMO}

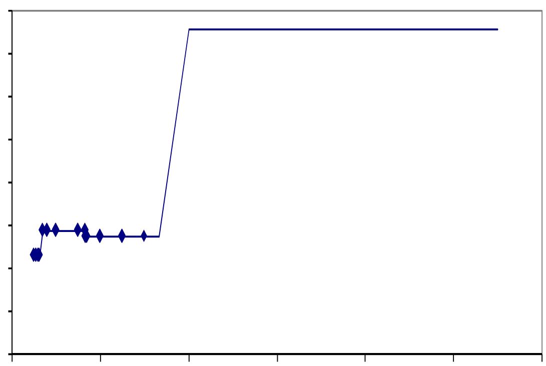
T

T

C_{FMIPv} T_{FMIPv} T

C_{FNEMO} T_{FNEMO} T

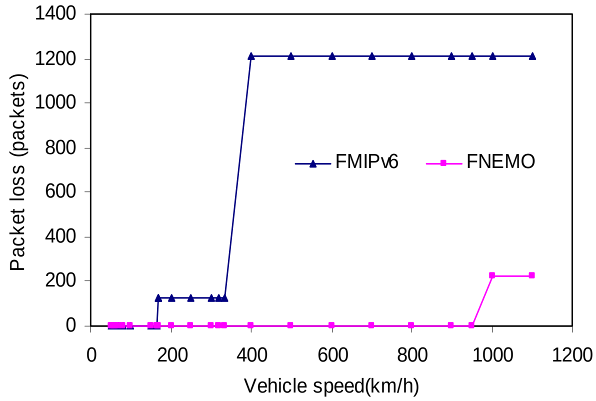
r



W_{max}.

W_{max}

$\frac{z}{m}$



1400
1200
1000
800
600
400
200
0
Packet loss (packets)
FMIPv6
FNEMO
0
200
400
600
800
1000
1200
Vehicle speed(km/h)