Corrigendum: 'WGSN: WLAN-based GPRS Support Node with Push Mechanism'

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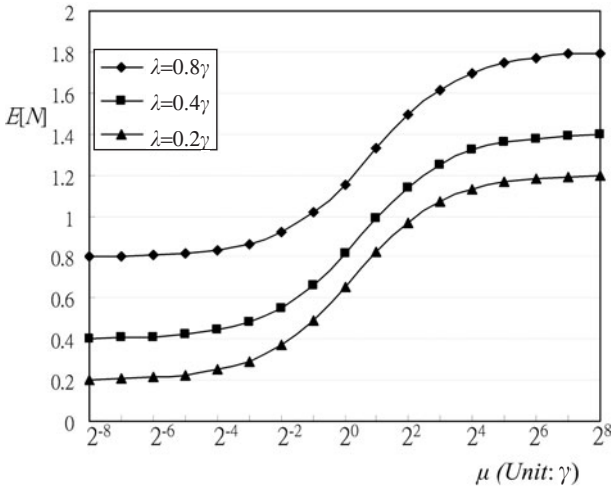
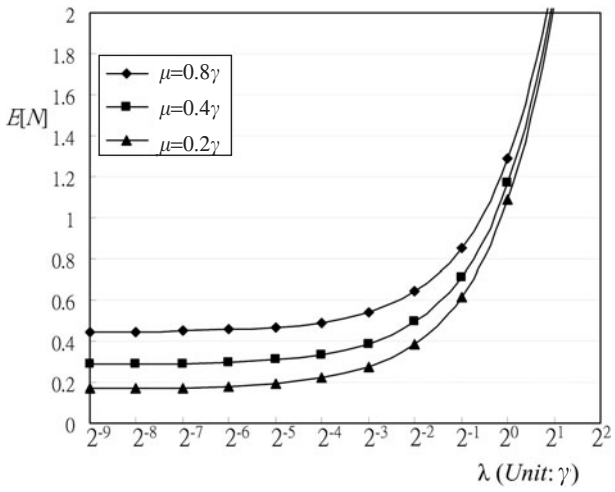
In the paper referred to in the title [1], there are errors in the performance analysis described in Section 5. The result shown in ([1], Equation (3)) is inaccurate, and the errors can be seen from the inconsistent measures of the right- and left-hand sides of the equation. The measure on the left-hand side of the equation is the number of lost calls, but the measure on the right-hand side is the rate of the Poisson distribution. In this note, we use a discrete event simulation model to investigate the performance of SIP UA. The simulation model follows the discrete event approach used in [2], and the details are omitted.

Figure 1 plots $E[N]$ against μ and λ. In Figure 1a, $E[N]$ increases as the expected T1 period $(1/\mu)$ decreases. When μ is very small (e.g. $\mu < 2^{-5}\gamma$), the length of *T1* approaches infinity, and the outstanding call keeps waiting until the SIP UA activation is completed. Therefore, the first outstanding call is always connected, and $E[N]$ approximates to the number of subsequent incoming calls arriving during the SIP UA activation period, which is λ/γ. On the other hand, if μ is very large (e.g. $\mu > 2^{6}\gamma$), *T1* approximates to 0, and *T1* expires immediately after an outstanding call arrives. Hence, the first outstanding call and all incoming calls arriving during the SIP UA activation are lost. The expected number of lost calls is $1 + \lambda/\gamma$. These results are clearly observed in Figure 1a. To obtain good $E[N]$ performance, it is appropriate to set μ as $\gamma/32$. For any μ values smaller than $\gamma/32$, the reduction in $E[N]$ is insignificant.

Figure 1b indicates that $E[N]$ is not significantly affected by the incoming call arrival rate, λ, when $\lambda < \gamma/32$. This result implies that to ensure good $E[N]$ performance, the SIP UA activation mechanism must be designed such that the activation time is shorter than 0.03125 times the inter-call arrival time.



(a) Effect of μ



(b) Effect of λ

FIGURE 1. Effects of μ (a) and λ (b) on the expected number of lost Calls.

REFERENCES

[1] Feng, W.-S., Wu, L.-Y., Lin, Y.-B. and Chen, W.-E. (2004) WGSN: WLAN-based GPRS support node with push mechanism. *Comput. J.*, **47**(4), 405–417.

[2] Lin, Y.-B., and Chen, Y.-K. (2003) Reducing authentication signaling traffic in third generation mobile network. *IEEE Trans. Wireless Commun.*, **2**(3), 491–501.