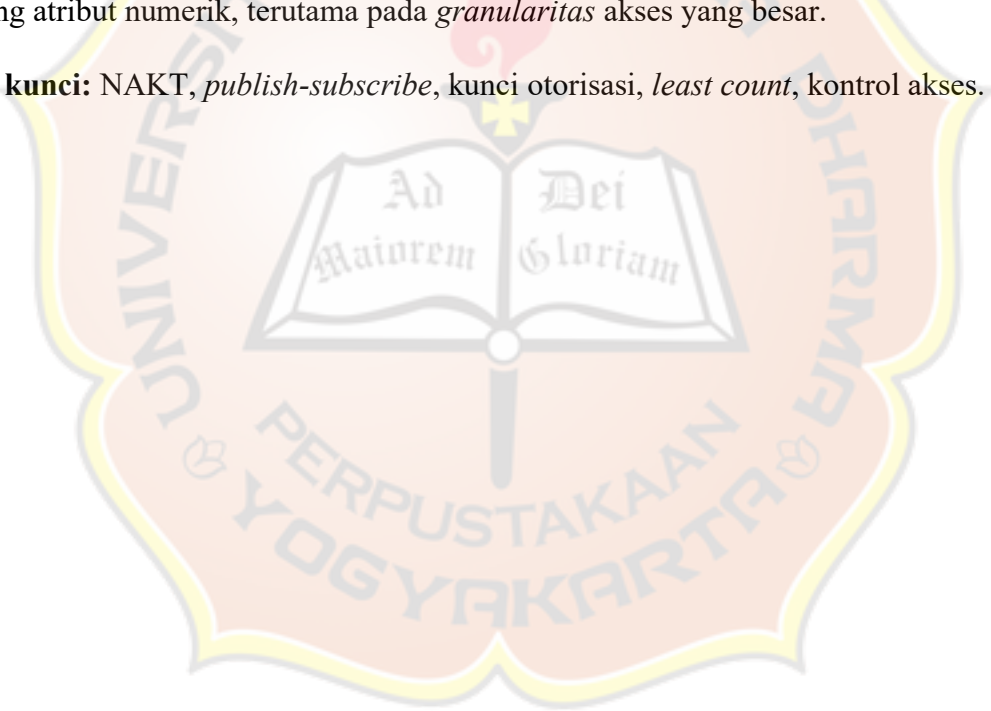


ABSTRAK

Penelitian ini menganalisis kinerja algoritma *Numeric Attribute Key Tree* (NAKT) dalam pembentukan kunci otorisasi pada model *publish-subscribe* sederhana. Masalah utama yang dikaji adalah efisiensi pengelolaan kunci ketika *subscriber* memiliki rentang akses berbeda terhadap atribut numerik. Penelitian ini menggunakan metode kuantitatif eksperimental berbasis simulasi dengan data set *Google Stock*. Atribut *Date* digunakan sebagai domain numerik, sedangkan atribut *Close* digunakan sebagai isi *event*. Data set memiliki 2.512 baris data dengan rentang tanggal 22 Juni 2016 sampai 18 Juni 2026 dan domain numerik sebesar 3.653 hari. Pengujian dilakukan dengan variasi nilai *least count* 1, 5, 30, 180, 360, 1800. Metrik yang dianalisis meliputi tinggi pohon, rata-rata kunci per *subscription*, jumlah kunci NAKT, jumlah kunci standar, dan efisiensi pengurangan kunci. Hasil penelitian menunjukkan bahwa peningkatan nilai *least count* menurunkan tinggi pohon dan rata-rata kunci per *subscription*. Pada *least count* 1800, NAKT menghasilkan efisiensi 99.92% karena hanya membutuhkan 3 kunci dibandingkan 3.649 kunci pada pendekatan standar. Namun, efisiensi menurun pada *granularitas* sangat kecil. Dengan demikian, NAKT efektif digunakan untuk pembentukan kunci otorisasi berbasis rentang atribut numerik, terutama pada *granularitas* akses yang besar.

Kata kunci: NAKT, *publish-subscribe*, kunci otorisasi, *least count*, kontrol akses.



ABSTRACT

This study analyzes the performance of the Numeric Attribute Key Tree (NAKT) algorithm in generating authorization keys within a simple publish-subscribe model. The main problem examined is the efficiency of key management when subscribers have different access ranges to numerical attributes. This study employs an experimental quantitative method based on simulation using the Google Stock dataset. The Date attribute is used as the numerical domain, while the Close attribute is used as the event content. The dataset consists of 2,512 data rows covering the period from June 22, 2016, to June 18, 2026, with a numerical domain spanning 3,653 days. The experiments were conducted using least count values of 1, 5, 30, 180, 360, and 1,800. The analyzed metrics include tree height, average number of keys per subscription, number of NAKT keys, number of standard keys, and key reduction efficiency. The results show that increasing the least count value reduces both the tree height and the average number of keys per subscription. At a least count of 1,800, NAKT achieves an efficiency of 99.92% because it requires only 3 keys compared with 3,649 keys in the standard approach. However, the efficiency decreases at very fine granularities. Therefore, NAKT is effective for generating authorization keys based on numerical attribute ranges, particularly when large access granularities are applied.

Keywords: NAKT, publish-subscribe, authorization keys, least count, access control.

