

# ICN 기반 테스트베드 아키텍처의 콘텐츠 이름 식별을 위한 메커니즘

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## A Mechanism for Identifying the Content Names in an ICN-based Testbed Architecture

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### Abstract

Information-Centric Networking (ICN) focuses on the information-based communication instead of the host-based communication. We have developed a testbed architecture based on Content-Centric Networking (CCN), a type of ICN that supports faster delivery of the requested contents using the name of the contents instead of using the location information. Hence, in this paper, we propose a new mechanism for identifying the contents in an ICN-based network by updating the scheme for naming used by the basic CCN and implemented the updated mechanism within the testbed architecture. The proposed naming mechanism can identify the requested content even if the name given by the users does not match exactly with the name of the content available at the content servers.

### I. Introduction

As the number of new contents being generated increases every day, it is necessary to manage those contents efficiently. There are many duplicate contents, and the same content may have slightly different names at a different content server. The host-based Internet architecture may experience higher latency in retrieving the requested contents. Furthermore, the host-based architecture is not suitable to provide faster content delivery with high efficiency due to the nature of location dependency. An information-based communication paradigm called Information-Centric Networking (ICN) has emerged to resolve the issues, and a variant of this approach is called Content-Centric Networking (CCN) [1]. The CCN paradigm mitigates the mentioned problems by focusing on the name of the requested content and provides other benefits including packet-level security and basic mobility support. We developed a testbed architecture that operates on the CCN, and in this paper, we propose a new naming mechanism used within the developed testbed framework that enhances the existing naming mechanism of the basic CCN.

### II. Creation of an Alias for Identifying the Contents

The basic CCN uses a hierarchical naming mechanism where the longest prefix matching algorithm is used. It creates unique names for each of the contents available at a content server. However, based on this approach, the same content can have a different name on a different server. Besides, the users who request a content can provide a wrongly spelled name of the desired content. The proposed naming mechanism enables the content servers within a network topology to identify the contents requested by the users by taking the name of a content created by the basic CCN as the input, creating an alias name, and mapping that name with slightly different names of the same content from different servers.

In order to create the alias name, the mechanism removes capitalizations, blank spaces, and special characters from the existing content name. This alias is then mapped to as many names of the same content from various neighboring servers as possible using the longest prefix matching algorithm. Therefore, the content servers can identify the requested contents even if the user provides slightly different spellings, including, capitalizations, blank spaces, and special characters or misspellings, and deliver the

content quickly. Below is the algorithm used by the proposed mechanism.

#### ALGORITHM: Algorithm for Creating an Alias

- Input:** Unique name of the contents created by the basic CCN
1. **REMOVE** the following from the *contents\_name*  
blank spaces, capitalizations, special characters
  2. **CREATE** *alias* name from the modified *contents\_name*
  3. **USE** longest prefix matching algorithm
  4. **MAP** *alias* name  $\leftarrow$  *contents\_name*

Figure 1 shows the procedure of the proposed mechanism.

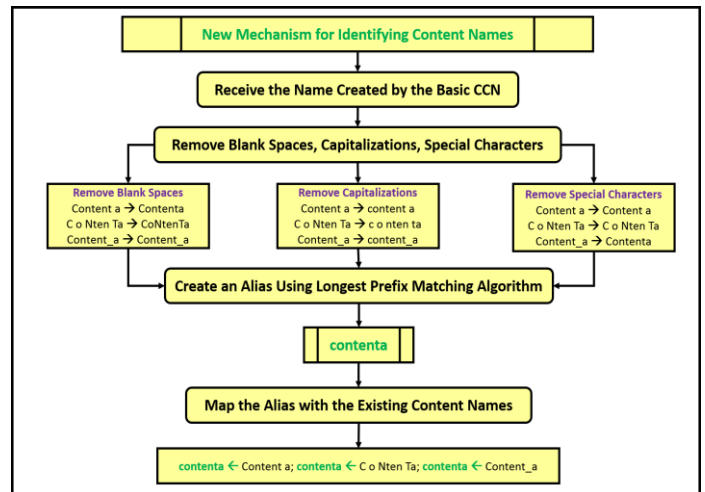


Figure 1: Procedure of the Proposed Mechanism

### III. Concluding Remarks

We proposed a new mechanism for identifying the contents in an ICN-based testbed architecture that creates an alias for the existing name of the contents and maps it with the slightly different names of the same contents.

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#### References

- [1] V. Jacobson, D. K. Smetters, J. D. Thorton, M. F. Plass, N. H. Briggs, and R. L. Braynard, "Networking Named Content," ACM CoNEXT, Dec 2009.