

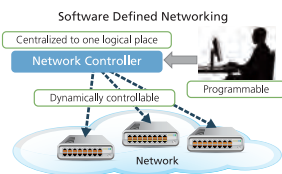
Scalable and Low-latency Communication Method for Reliability Improvement of SDN MPI_Bcast

Cybermedia Center, Osaka University, Japan

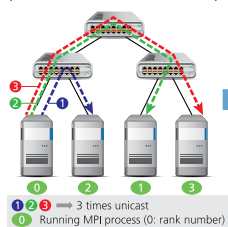
Communication time of MPI_Bcast collective tends to get longer on a large-scaled cluster.

Previous Work

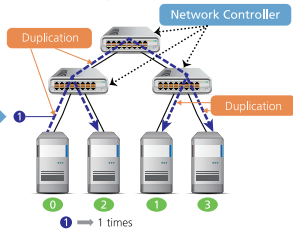
Our previous work implements MPI_Bcast through duplication of broadcast data on the fly from source process to others leveraging SDN. As the result, source process sends data only once for broadcasting data.



Conventional MPI_Bcast (uses unicast communications)



Prototype SDN MPI_Bcast



Problem of Previous Work

Data delivery from source process to others is not guaranteed in prototype SDN MPI_Bcast.

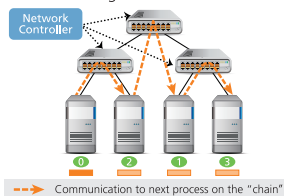
Research Goal

To implement scalable and low-latency "chain" communication method for improving reliability of prototype SDN MPI_Bcast.

- All receiving processes need to let source process know they received data.

Proposal

Each process sends data to next process on the "chain" for the acknowledgement of data receiving.



"chain": series of all processes placed in a line.
Eg. 0→2→3→1, 0→1→2→3

Reliable SDN MPI_Bcast has two stages.

- Source process sends data using prototype SDN MPI_Bcast.
- Each process sends data to next process on the "chain" as soon as receives it.

Low-latency: Network controller generates the "chain" considering network topology and process placement
Scalable: Each process responsible for only one process' data delivery

Khureltulga Dashdavaa*, Munkhdorj Baatarsurent, Keichi Takahashi*, Susumu Date*, Yoshiyuki Kido*, and Shinji Shimozono* *Osaka University, Japan, †The University of Tokyo, Japan



Contact : Khureltulga Dashdavaa huchka@ais.cmc.osaka-u.ac.jp

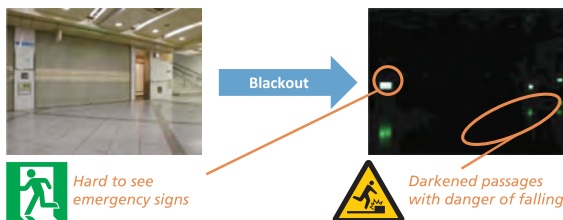
Indoor Evacuation System With Smartphones That Helps Evacuees In a Blacked Out Building

Cybermedia Center, Osaka University, Japan

1. Introduction

When a disaster happens, people in a building have to escape as quickly as possible.

However, **Power failure** may occur and prevent people from escaping.



As a result, people take long time to escape and are in danger of losing their lives.

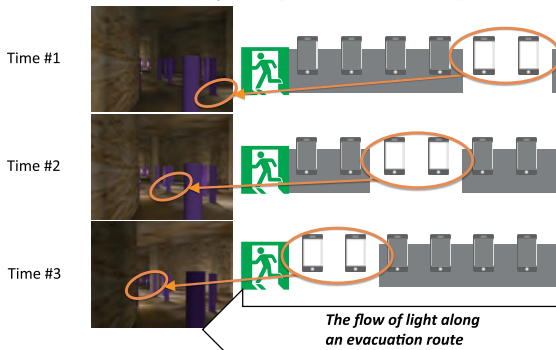
2. Our proposal

Our research group has proposed an **indoor evacuation system that utilizes people's smartphones**



Our system provides information of the evacuation routes and illuminates the passages around people at the same time.

- Illuminates passages by **turning smartphone's lights on**
- Indicates evacuation routes by **making each smartphone's light blinks**



3. Future work

In order to implement our system, an **indoor positioning method for smartphones** is needed.

A method that **finds the most appropriate evacuation route** is also needed.

Contact: Takuya Yamada yamada.takuya@ais.cmc.osaka-u.ac.jp

Scalable and Low-latency Communication Method for Reliability Improvement of SDN MPI_Bcast

Indoor Evacuation System With Smartphones That Helps Evacuees In a Blacked Out Building