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The Performance Improvement of Opportunistic Communication using wired network

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“Opportunistic Communication” (OC) has been during attention because nodes directly exchanges information without any infrastructure using a wireless communication technology. The OC make use of human mobility. In addition, the OC is power efficient, because create paths only when they communicate. Therefore, the oc can use, if the communication resources are limited like in disaster scenario.

In the establishment of the oc the human mobility, node density are involved. There is the possibility in which communication does not occur, if the distance between two node is too far. In addition, node density is different from location. This means that the frequency of communication occurrence depends on the area where people live. Also, users of the OC frequently wants to communicate with users with desired information.

In this research proposed a new method that is called “Pocket Warped Network” (PWN). The PWN can introduce the OC among remote nodes. The PWN uses the mechanism that is called “Tunnel Point” in addition to the nodes.

The tunnel point has the function to discover the exist nodes in the neighborhood in a arrange a position, it creates a tunnel between the tunnel points, and sends radio frame forwards over of the tunnel. Therefore, if a

node present in a location where communication is extremely difficult, it can communicate via a wired network of tunnel point.

PWN is composed of Kurage, Ikagent and Tako. Kurage is a mechanism for tunnel point to inform the existence of other tunnel points to create a tunnel. Kurage provides an overlay network that forms a virtual communication path on an existing network. Ikagent is a tunnel point. Ikagent has the function to create a tunnel, selection of other Ikagent as a destination tunnel point, and collect the information of Tako. In this research, it has implemented a Ikagent with these functions. Tako is a node. To realization of PWN, Tako does not to add or change a function.

The simulated and tunnel point environment has been developed that didn't exist before, the communication is verified by comparative experiments of probability of occurrence. The simulation designed two scenarios experiments, in first case, the node placed in one of the cluster, and as the tunnel points are increased, become dense exponentially. In second case, the nodes are distributed across multiple clusters, and it improves the probability of communication occurrence in logarithmic manner.

When Ikagent creates a tunnel in PWN, information on Tako which exists in its follower, is used. It proposes the tunnel point selection algorithm as a technique for automatically create the tunnel between others Ikagent where the information exists. Therefore, Tako sends information to Ikagent that exists in the vicinity. By introducing the tunnel point selection algorithm, the occurrence of the OC can not but also the quality of information exchange at the unit time is improved.

“Random_App”, “Exact_Match”, and “Common_App” were designed as Ikagent selection algorithm. The application information that Tako maintains, is used in these three algorithms. The Random_App chooses randomly one of the applications that Tako maintains. And, examines whether the same application exists under the others Ikagent. Exact_Match examines whether all applications that Tako holds exists in the other. Common_App examines the application information on all Tako that the of Ikagent has, and creates set of the applications. Random_App and Exact_Match make a decision aboard Ikagent for tunnel creation base on Tako's information that maintains the same application. Common_App decides Ikagent that a common number is a lot of to sets of the made applications

the tunnel creating ahead.

To conform the operations of each algorithm correctly, The experiment were using the Kurage, Ikagent, and Tako. As a result, the information acquired from Tako and Ikagent based on the decided acquisition method confrims the accuracy of algorithms. Therefore, it can be said that PWN is able to perform correctly.

The results of this study, are present that the communication which has been possible difficult to perform the OC. Also, it is possible to selection the communication partner from the user's request which was difficult with conventional the OC. Thus, using PWN method it is possible to provide a more useful the OC to the users.