O-ICN Simulator (OICNSIM)

OICNSIM, an ns3 based simulator, simulates the O-ICN (Overlay Information Centric Network) Architecture [1, 2]. Some of its main components are described below.

OICNZipfClient

1. A separate Application for sending ICN type of request.
2. Send the UDP name resolution request to query for the name required.
3. Content request generation follow Zipf distribution.

OicnClient

1. A separate Application for sending ICN type of request.
2. Send the UDP name resolution request to query for the name required.

ICN Manager:

1. A software component can work standalone or may coincide with DNS server, SDN controller.
2. This uses a separate port (36) to listen to User requests (from the client).
3. Resolve the name request (check whether content present at ICN router or server)
4. Send request to source of content (router or server) to send content to client.
5. Send back ACK/NACK to client.

ICN Routers:

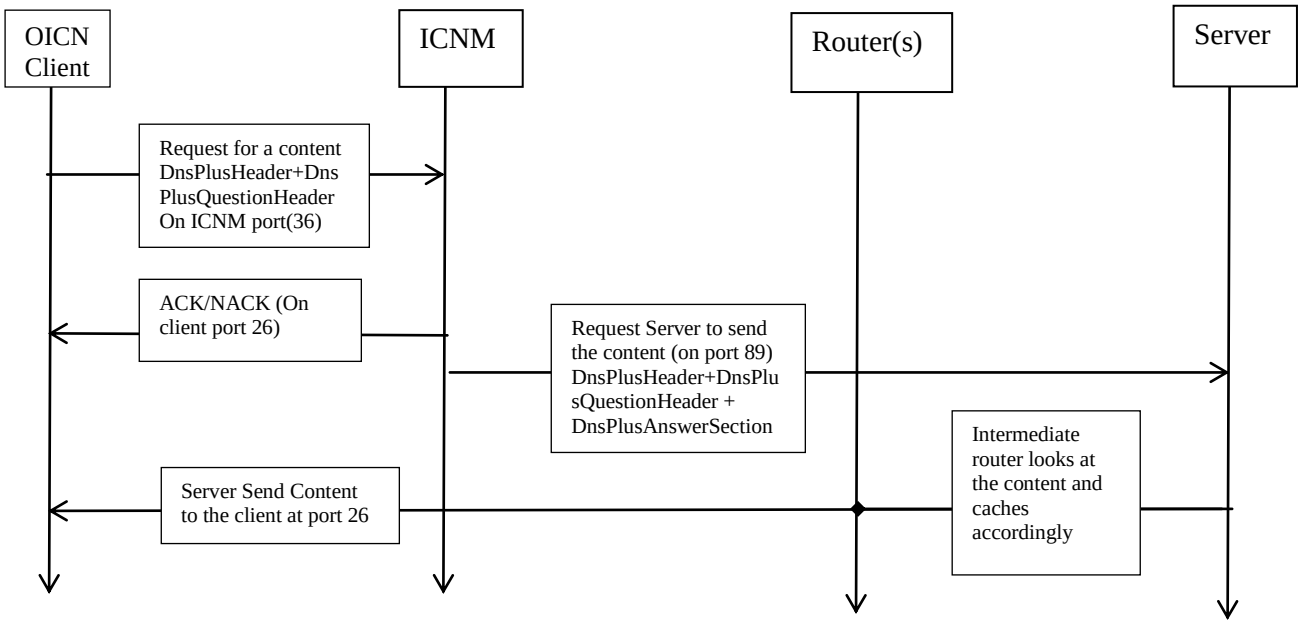
1. A normal router patched with ICN functionality.
2. It caches the content.
3. It listens to ICN Manager at port 89.
4. ICN Manager sends request to ICN Router to send cached content to client when requested by the client.
5. ICN Router returns ACK/NACK to ICN Manager.

OICN Server

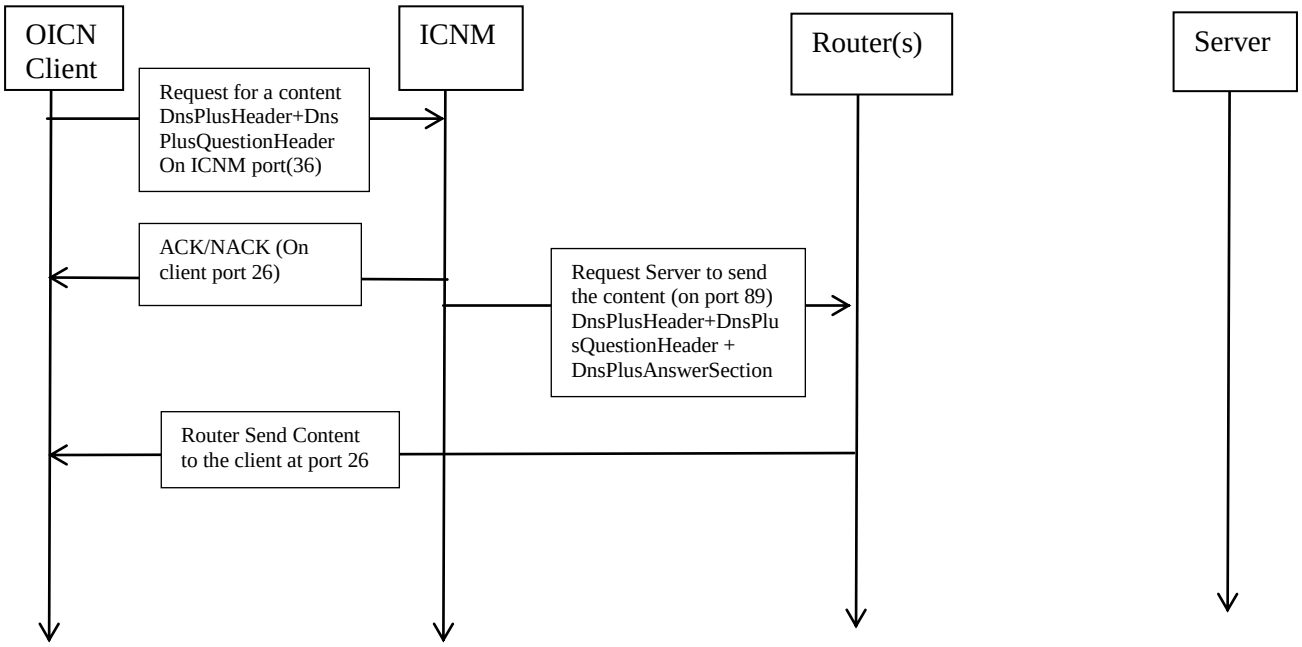
1. It accepts the content request from the ICN Manager and send content to the client.
2. It listens to the content request at port 89.

High Level Timing diagram for ICN Request Flow:

Case I: In this diagram we have shown the case, when client is asking the content which is not cached in the router. So the content request is redirect to server.



Case II: In this diagram we have shown when client is asking the content which has been already cached in the router. So the content request is redirect to router.



References:

[1] S. Shailendra, B. Panigrahi, H. K. Rath, and A. Simha, "A Novel Overlay Architecture for Information Centric Networking," in Twenty First IEEE National Conference on Communications (NCC), pp. 1–6, 2015.

[2] "Providing Requested Content in an Overlay Information Centric Networking (O-ICN) Architecture", US Patent (Patent Filing number# 14/693949)