IPv6 Home Network Naming Delegation Architecture

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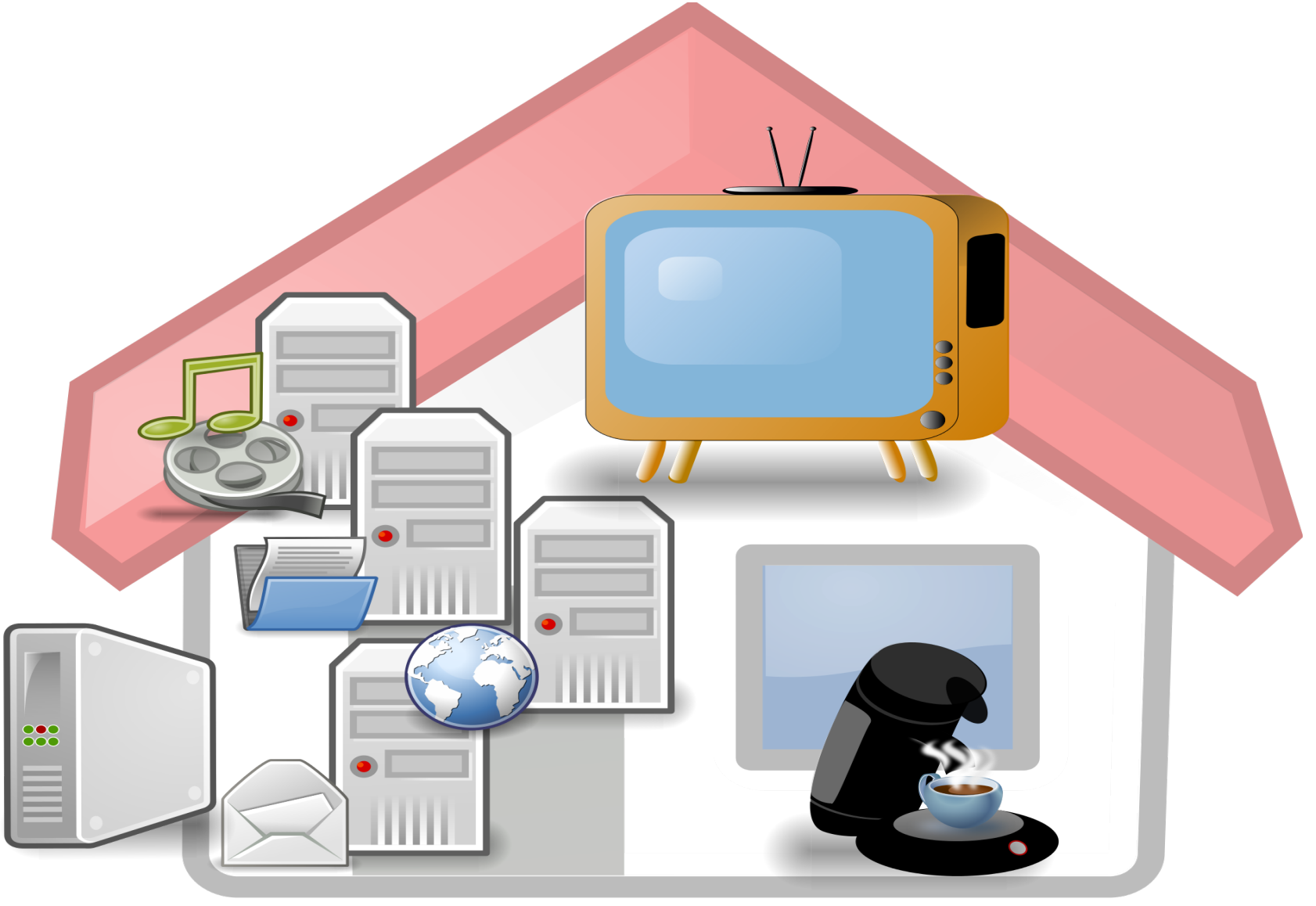
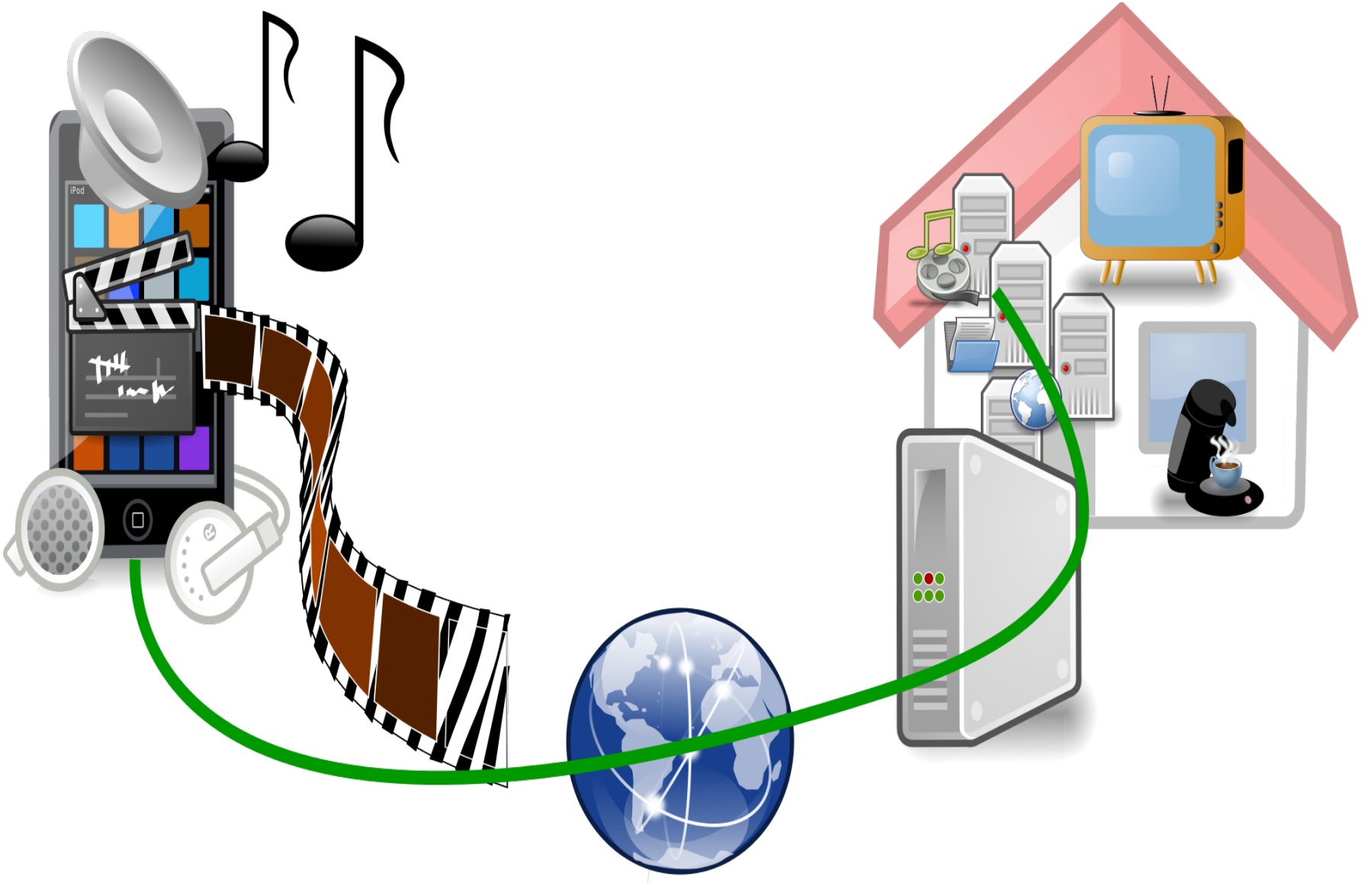


I. Introduction: What End Users want



I. Introduction

We considered the following situation:

- Homenetworks are more and more complex, hosting multiple Services
- End Users want to reach these Services
- With IPv6, Services will become globally reachable
- End Users want to reach these Services with Names not IP adresses

Using Names requires to define a naming architecture for CPEs

Thus the document:

- Lists the requirements for such a naming architecture
- Describes a Naming Delegation Architecture that address the problem

II. Naming Architecture Requirements

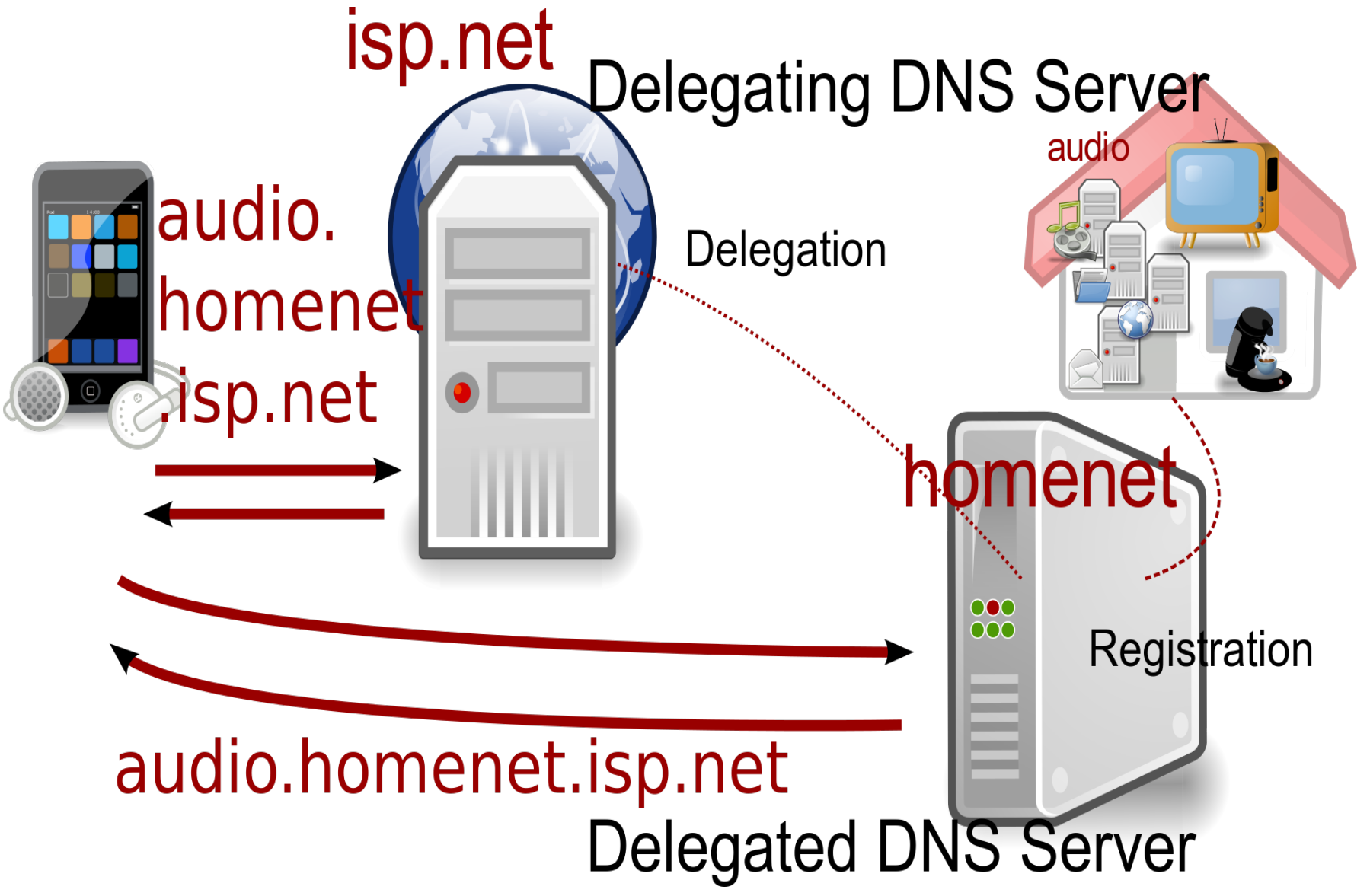
End Users requirements are:

- Centralized Naming Configuration
- Automatic Configuration
- Advanced Configuration enable
- Privacy Protection By Design

ISPs requirement is:

- Make the Home Network Naming Architecture Scalable

III. Naming Delegation Architecture



III. Naming Delegation Architecture

The Naming Delegation Architecture consists in:

- Considering the CPE as an Authoritative DNS Server for the Homenetwork
- Attaching the DNS Server of the CPE to the global DNS Infrastructure

In the Naming Delegation Architecture:

- Attachment is performed by the ISP that provides upper domain (isp.net)
- DNS(SEC) Delegation is automatically set when the CPE is plugged

IV. Setting Naming Delegation

As ISPs provide IP and FQDN reachability:

- FQDN (homenet) is pre-agreed between End User and the ISP
- FQDN provides FQDN reachability
- IP address / prefix provides IP reachability
- IP and FQDN are provided by the ISP to the CPE, using DHCP

IV. Setting Naming Delegation

Involved entities are:

- ISP Delegating DNS Server: Provides DNS delegation
- CPE Delegated DNS Server: DNS Server for the Homenetwork
- CPE DHCP client:
  - Get IP prefix / FQDN from the ISP
  - Sets the Delegated DNS Server
  - Provides information to the Delegating DNS Server
- ISP DHCP Server:
  - Get Delegated DNS Server Information
  - Sets the Delegating DNS Server
  - Provides IP prefix and FQDN to the CPE
- CPE DHCP Server: Collects IP addresses from the Homenetwork

V. DHCP Exchanges

When the CPE requests an IP address it provides the DHCP Options:

- DELEGATED_DNS_ARCHITECTURE: lists the Naming Delegation Architecture accepted by the CPE, (DNS / DNSSEC)
- DELEGATED_DNS_ADDR_INFO: provides information so the ISP DHCP Server derives the IP address of the Delegated DNS Server. This is necessary to set the DNS delegation (NS) on the ISP Delegating DNS Server
- DS: only used with DNSSEC contains the Delegated Delegation of Signing of the Delegated DNS Server

The ISP DHCP Server responds with

- DELEGATED_DNS_ARCHITECTURE: indicates the Naming Delegation Architecture chosen by the ISP
- DELEGATED_DOMAIN: the FQDN agreed between the ISP and the End User

VII. What to do Next

Next version will clarify:

- The service provided by the ISP
- The delegating server is owned by the ISP
- DNSSEC Delegation with multiple DS
- Recommendation for the key rollover (TTL, double DS)

Do we need to documents one for DNS, one for DNSSEC?

Do you think it should be adopted as a WG document?