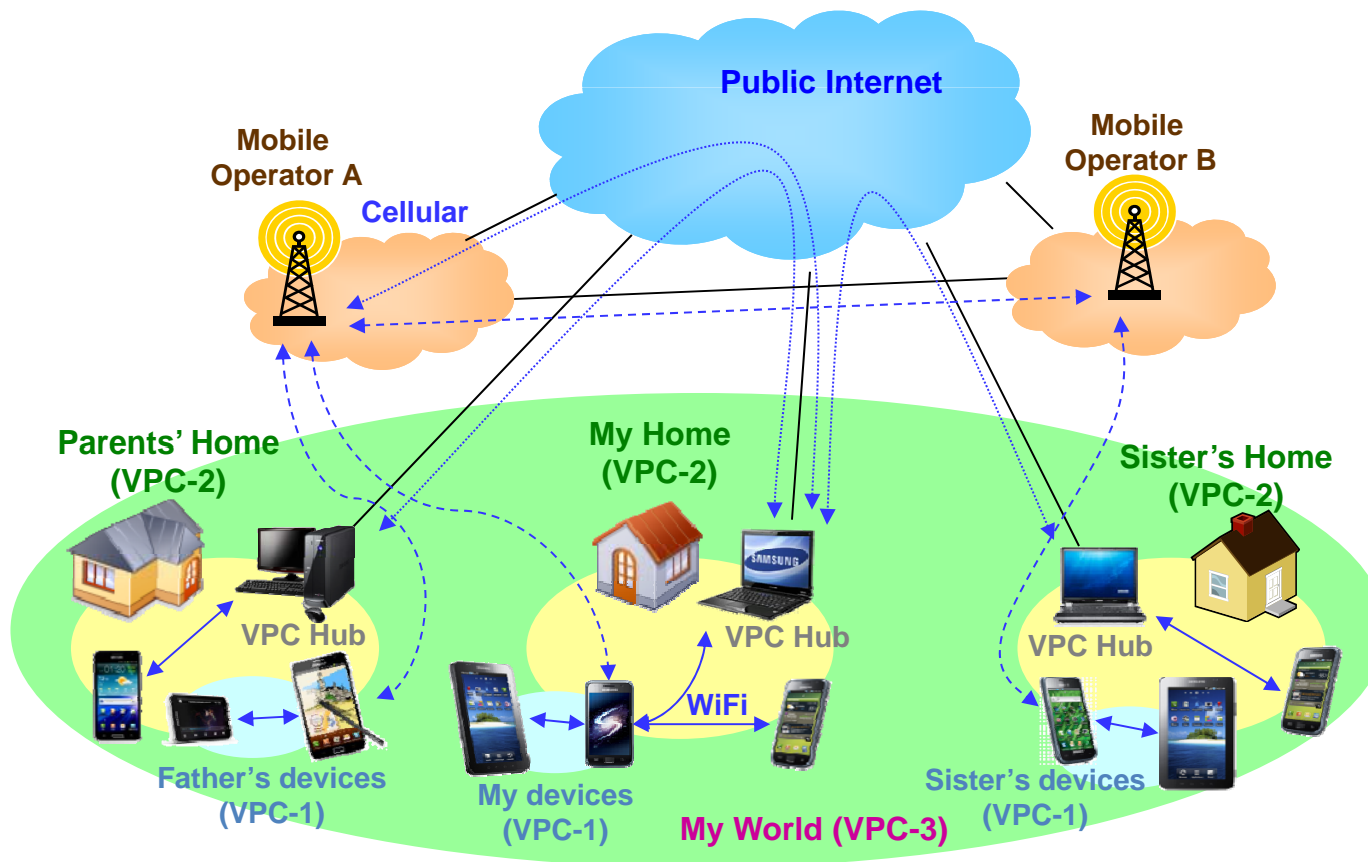# ICN for VPC
(Virtual Private Community)

Myeong-Wuk Jang

Samsung Advanced Institute of Technology

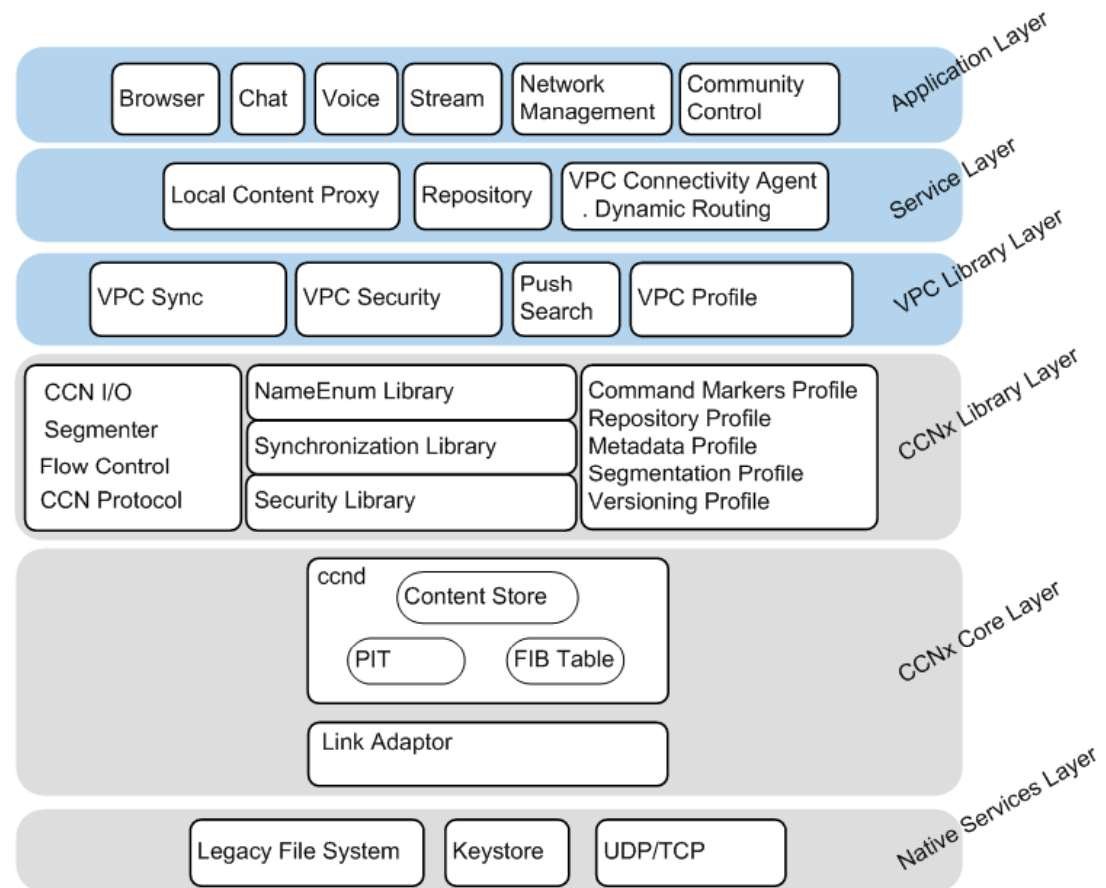IETF 83, Paris – March 2012

VPC (Virtual Private Community)

- Content sharing service platform
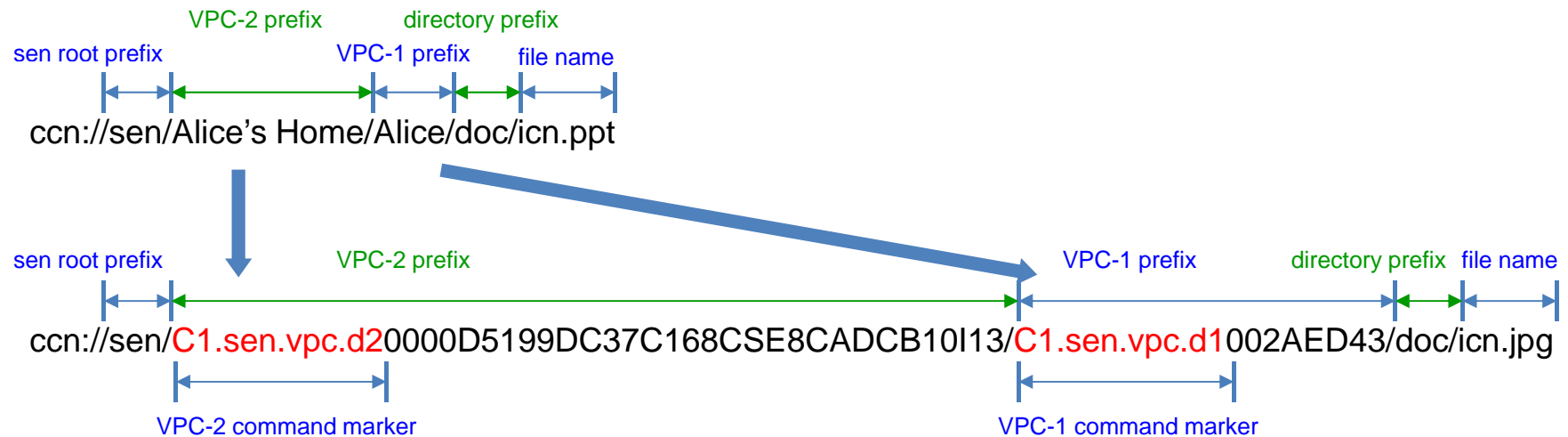 - Severless
  - Secure

CCN VPC Architecture

- Naming convention for VPC
- VPC Connectivity Agent (VCA): routing daemon
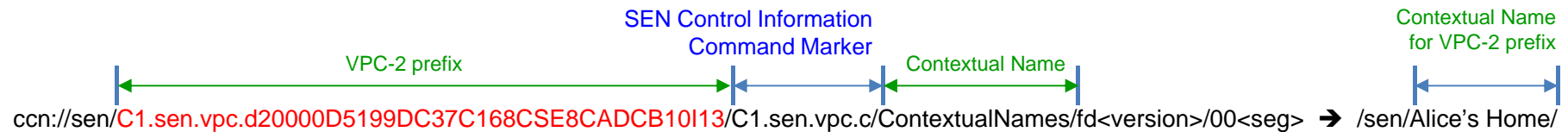- Community Control: enrollment-based security management

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Naming

- Dual naming convention
  - User friendly contextual name: used for users
  - Routable backstop name: used in CCN

VPC-2 prefix   directory prefix

sen root prefix   VPC-1 prefix   file name

ccn://sen/Alice's Home/Alice/doc/icn.ppt

sen root prefix   VPC-2 prefix   VPC-1 prefix   directory prefix file name

ccn://sen/C1.sen.vpc.d20000D5199DC37C168CSE8CADCB10I13/C1.sen.vpc.d1002AED43/doc/icn.jpg

VPC-2 command marker   VPC-1 command marker

- Contextual name discovery

VPC-2 prefix   SEN Control Information Command Marker   Contextual Name   Contextual Name for VPC-2 prefix

ccn://sen/C1.sen.vpc.d20000D5199DC37C168CSE8CADCB10I13/C1.sen.vpc.c/ContextualNames/fd<version>/00<seg> ➜ /sen/Alice's Home/

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Routing

- Custodian※-based routing
  - A name prefix is mapped to a custodian

Node A

CCN Application
① Get [/vpc2/vpc1a/hsn.ppt]

CCN VPC Library

VCA
⑥ Find Next Hop

Routing Table	
/vpc2/vpc1a	Node B
/vpc2/vpc1b	Node C

⑦ Create Link to Node B

② Send Interest [/vpc2/vpc1a/hsn.ppt]

⑪ Re-send Interest [/vpc2/vpc1a/hsn.ppt]

⑤ Send Unsatisfied Interest [/vpc2/vpc1a/hsn.ppt]

CCND
⑫ FIB Table Lookup
③ FIB Table Lookup

Content Store
⑬ Insert PIT Entry
④ Insert PIT Entry

FIB	
/	1
/vpc2/vpc1a	2

PIT ⑩ Delete PIT Entry	
/vpc2/vpc1a/hsn.ppt	1
/vpc2/vpc1a/hsn.ppt	2

⑨ Create Face 2 through VCA

⑭ Send Interest to Face 2

Link Adaptor

⑧ Establish Connection to Node B

Node B

Node C

※ custodian: the identifier of a device that has content

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Security

- CCN's Digital Signature Scheme
    - to guarantee the integrity of transmitted contents
    - to authenticate original publishers of the contents
- VPC Trust Model
    - Enrollment: local enrollment using WiFi, remote enrollment using SMS
   - Association: An inviter issues a membership credential to an invitee.

LLC-based enrollment

inviter   invitee
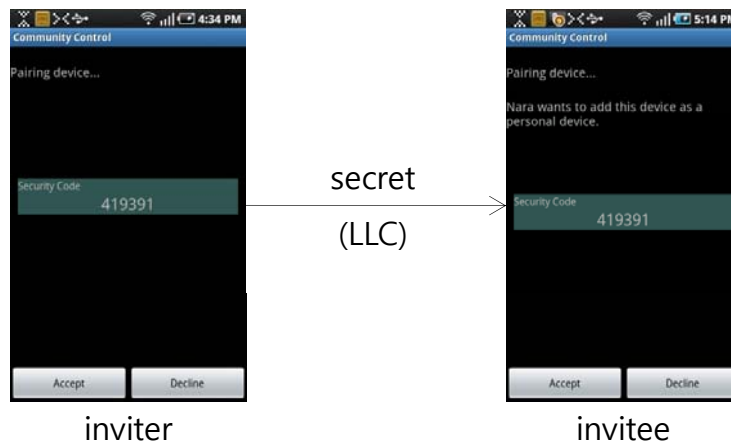
※ LLC: Location-Limited Channel
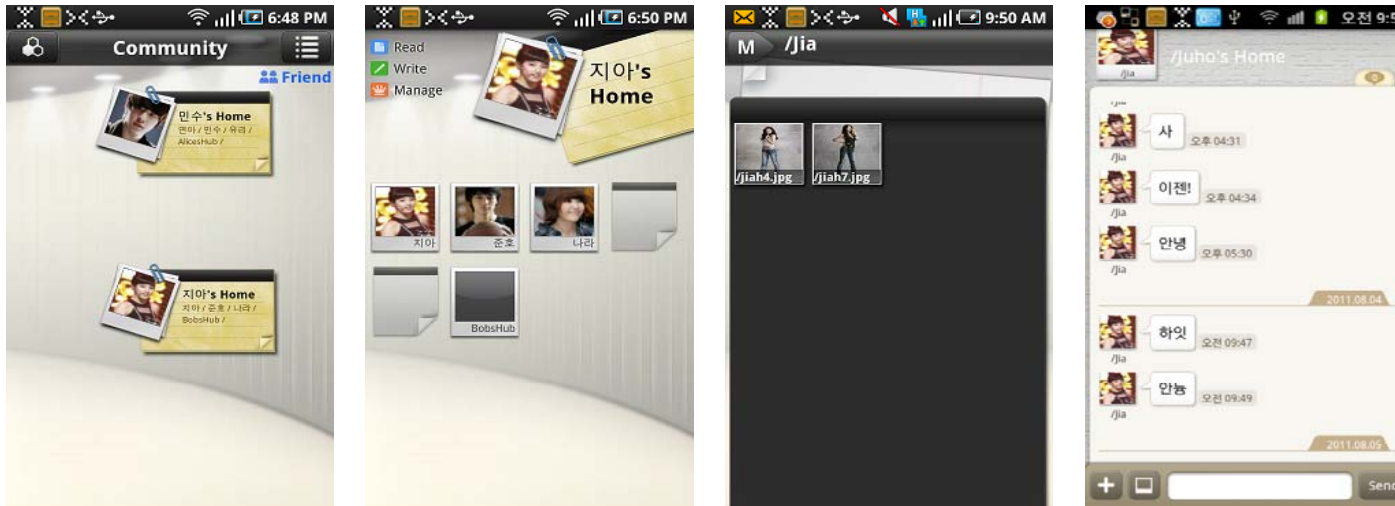
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Prototype Experimentation

- 40 devices (Galaxy S2/Tab and Linux PC) connected over 4 VPC-2s
  - Easy enrollment & access control, content browsing, push, video streaming
  - Wi-Fi and 3G cellular
  - CCN cache vs. IP-like non-cache performance comparison

IP–like (CCN without Cache)

CCN

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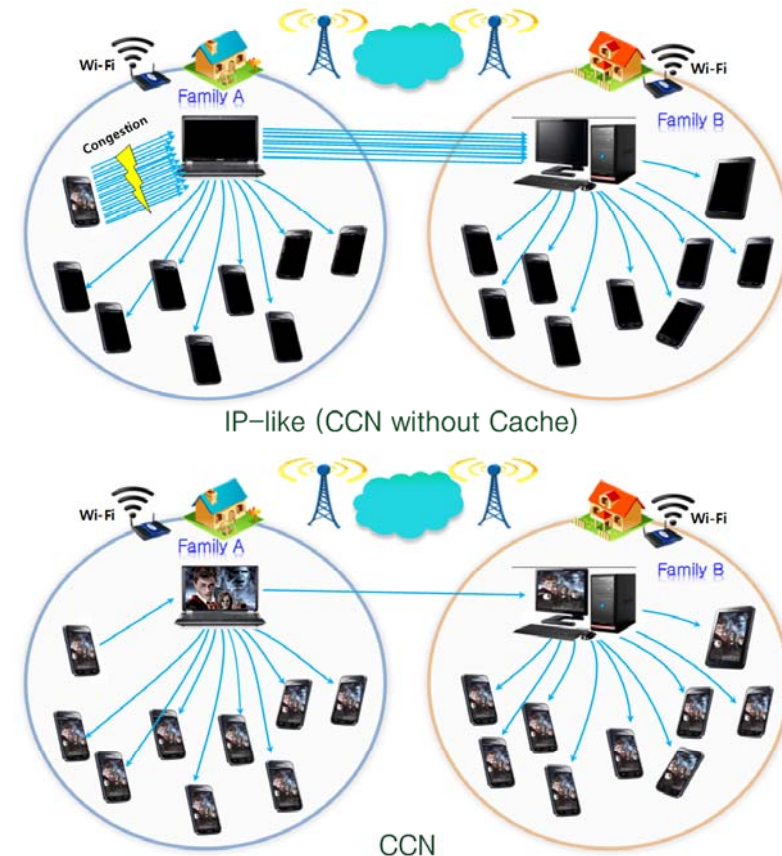
User Interface & Service

- User Interface

- Service
  - content browsing & access
  - chat
  - voice conference
  - live video streaming

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Thank you!
Any Question?

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