From PURSUIT to POINT

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POINT

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Outline

• Motivation
• PSIRP and PURSUIT
• POINT: IP Over ICN - The Better IP?
  – Design & Reference architecture
  – Objectives
  – Platform & Implementation
  – Validation & Trials
• Conclusions
Motivation

• Why yet another pub/sub ICN project?
  – 1\textsuperscript{st} gen ICN explored the space
    • Produced implementation prototypes
  – 2\textsuperscript{nd} gen ICN refined the approach
    • Produced fully fledged implementation
  – 3\textsuperscript{rd} gen ICN is about deployment
    • Use ICN prototype under the hood
    • Offer IP services on top of that
    • Sneak ICN through the back door!
PSIRP and PURSUIT

• PSIRP: 2008-2010
  – Design and prototype basic concepts
  – Rough host and protocol implementations

• PURSUIT: 2010-2013
  – Refine design into comprehensive prototype
  – Evaluate performance over testbed & PlanetLab
  – Explore new opportunities
    • Multipath/multisource, traffic engineering, etc.
POINT: IP Over ICN - The Better IP?

• Concept
  – Premise: IP apps can do better over ICN
    • Need to define what “better” means
    • Ensure that there is a clear benefit to operators
  – Better utilisation in HTTP streaming scenarios
  – Better privacy of personal data and metadata
  – Better management of virtual network paths
  – Better (fairer) content distribution
Design

• ICN deployed within one provider
  – Entire network under single control

• No changes to existing User Equipment
  – Compatibility with IP/UDP/TCP/HTTP/…

• ICN used internally in the network
  – Transparently map IP to ICN concepts

• ICN visible only to new User Equipment
  – Small footprint IoT devices
Reference Architecture

The realization of the ICN<sub>x</sub> interfaces varies depending on the dissemination strategy.
Objectives

• Define KPIs from an IP viewpoint
• Define a platform with clear interfaces
• Map Internet abstractions to ICN ones
• Develop resource coordination mechanisms
• Implement a POINT platform prototype
• Deploy and evaluate in a field trial
• Evaluate the commercial viability of POINT
Platform

• Blackadder + extensions/improvements
• Application-facing abstractions
• Novel dissemination strategies
• Integration with SDN
• Flexibly-grained QoS
• Key target protocols/services
  – IP, TCP, CoAP, HTTP, …
Implementation

Fine-granular QoS Abstraction

<table>
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<tr>
<th>App1</th>
<th>App2</th>
<th>App3</th>
<th>App4</th>
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<tbody>
<tr>
<td>IP Abstraction</td>
<td>TCP Abstraction</td>
<td>HTTP Abstraction</td>
<td>CoAP Abstraction</td>
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Pub/Sub (Information-centric) Service Abstraction

LIPSIN

MSBF

POINT Alternative 3

ICN-over-SDN shim layer

SDN

L2 Transport Networks
Validation

• Internal POINT testbed
  – Each partner contributes some machines
  – OpenVPN used for virtual L2 connections
  – Real L2 connections between some partners

• Validation goals
  – Verify that unmodified UEs operate
  – Assess KPIs in controlled environment
  – Fine tune system operation and performance
Trials

• Production network
  – PRIMETEL will provide operational network
  – INTRAKOM will provide value-added platform
  – Beta testing with real users
  – Connectivity to internal testbed

• Trial goals
  – Establish viability of POINT concept
  – Evaluate KPIs on a real network
Conclusions

• A cunning plan for ICN
  – Provide standard IP services over ICN
  – Allow new ICN applications to appear

• POINT approach: Blackadder +
  – Deploy platform over SDN
  – Extend mechanisms for new networks
  – Offer abstractions for IP services
  – Evaluate performance with sensible KPIs
References

• POINT Home: http://www.point-h2020.eu/
Thank you

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