

ICN-Enabled Secure Edge Networking with Augmented Reality (ICE-AR): Y2 Progress Overview

FLORIDA INTERNATIONAL UNIVERSITY

NEW MEXICO STATE UNIVERSITY

UCLA

Information Centricity

- ◇ Information Centric Networking: networking applications
 - “Application driven architecture development”
- ◇ Communication centered on information → fetching application-named data
- ◇ Data secured at generation time → Enabling air-tight security
 - ▷ Also enabling fine granularity of security control

application data name

a few pieces of metainfo

data

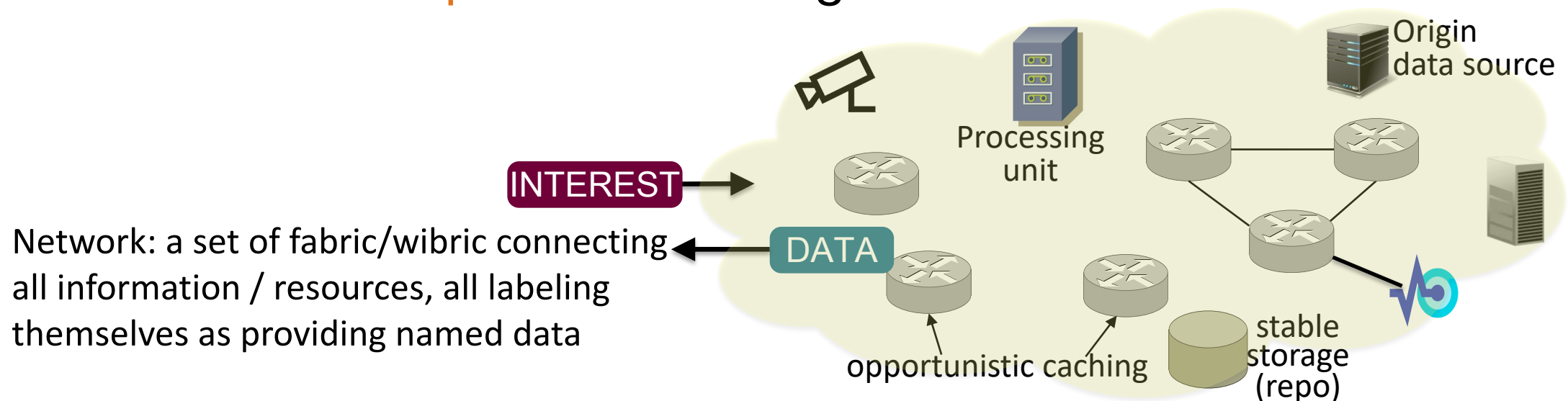
crypto signature



Producer binds name to content to create **Data packet**

ICN Enabling Integration

- ◇ Network delivers named, secured data
- ◇ Storage can supply named, secured data equally well
- ◇ So can processing units
 - Processing servers announce their **services**
 - Clients **name** the processing results
 - Network forwards **requests** to offering **servers**





ICN+COMPOSABLE APPLICATIONS

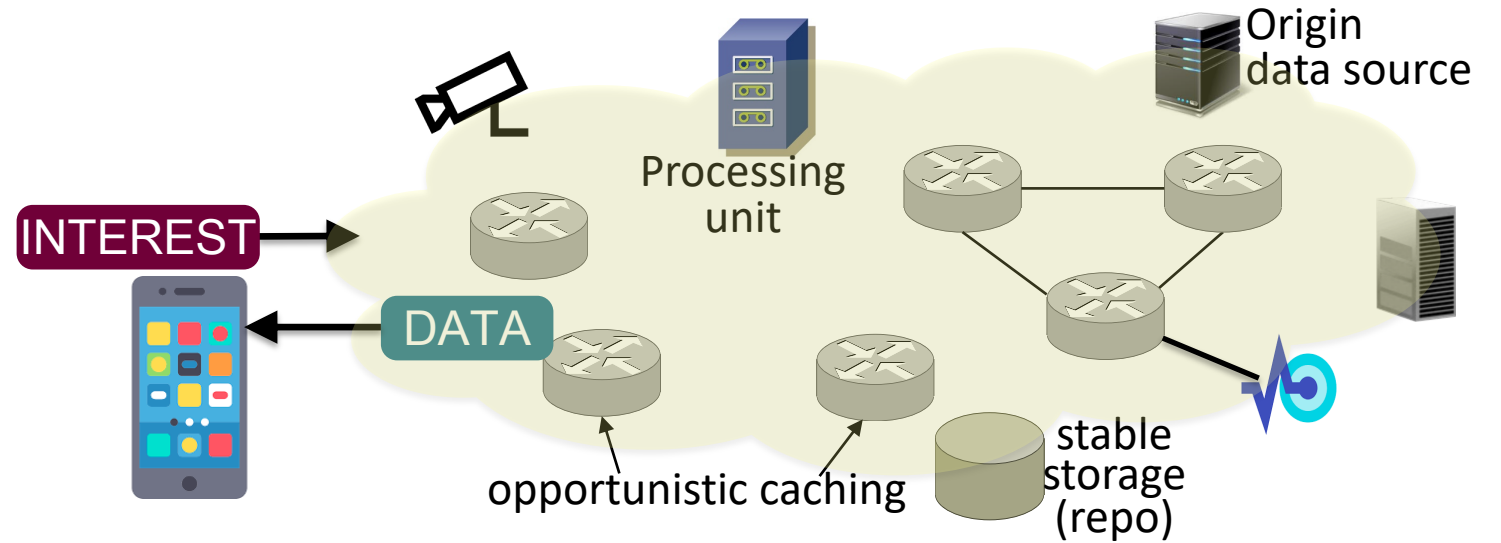


- Can the network provide this level of service discoverability and execution?
- Do-able with IP Networks
 - but assumes prior knowledge of a service "finder"
 - Not necessarily optimized for latency or cost at the edge
- Call to Action: Can ICN help?

YES

ICE-AR Integration

- ◇ processing acceleration
- ◇ Applications
- ◇ Wireless
- ◇ Security



The rest is draft material

Exciting Exploration

- ◇ Remote processing service over NDN
 - The use of forwarding hints provides separation between (server) locator and (data) identifier

Challenges

- ◇ Naming remains the center of research focus
- ◇ Jostling various requirements from different angles

Lessons Learned

- ◇ From node-centric to data centric: the switch-over will take time
 - ICN/NDN means directly working with app
 - current packages do not allow

Look into Year 3

◇ Application

- show unique NDN benefits for granular access to media by designing and implemented spatial selectivity within video in NDN-RTC;
- support integration with other areas in demonstration
- Evaluation of NDN benefits for AR and MR based on the experience from the ICE-AR project.

◇ Acceleration

- integrating accelerator to NDN platform;
- further improve the current design and search for better models that are more suitable for FPGA; and
- if time permits, explore the possible use of SmartNIC for in-network acceleration.

◇ Security

- implement multi-level identity certificates as promised in the proposal;
- extend the preliminary work on ABS to address its performance challenges; and
- develop ICE-AR security function demonstrations to show support for desired application scenarios with attribute-based signature solution.

◇ Wireless

- devise a rate adaptation algorithm to enable dynamic rate adjustment by multicast sender;
- provide multicast support for Android phones (at this time, they can receive, but not send, multicast packets); and
- further improve the learning and reasoning capabilities of wireless channels.