ICNRG IAB Review

IETF–86
March 2013

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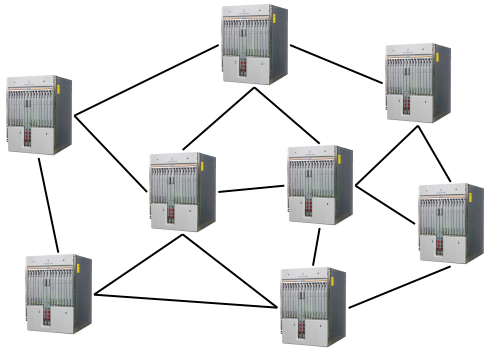
Information Centric Networking (ICN) Background

Today's Internet

Focus on
nodes



Evolution

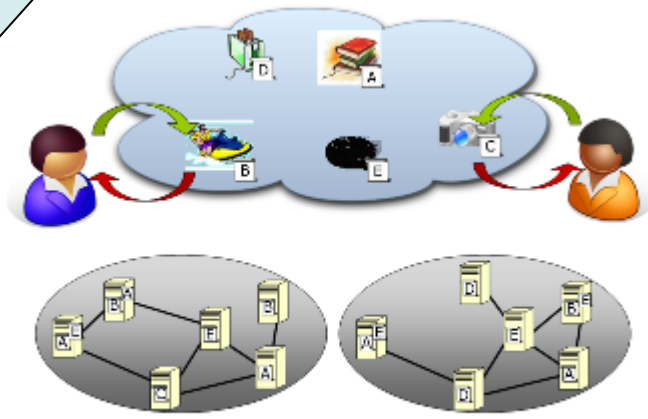
Web

CDN

P2P

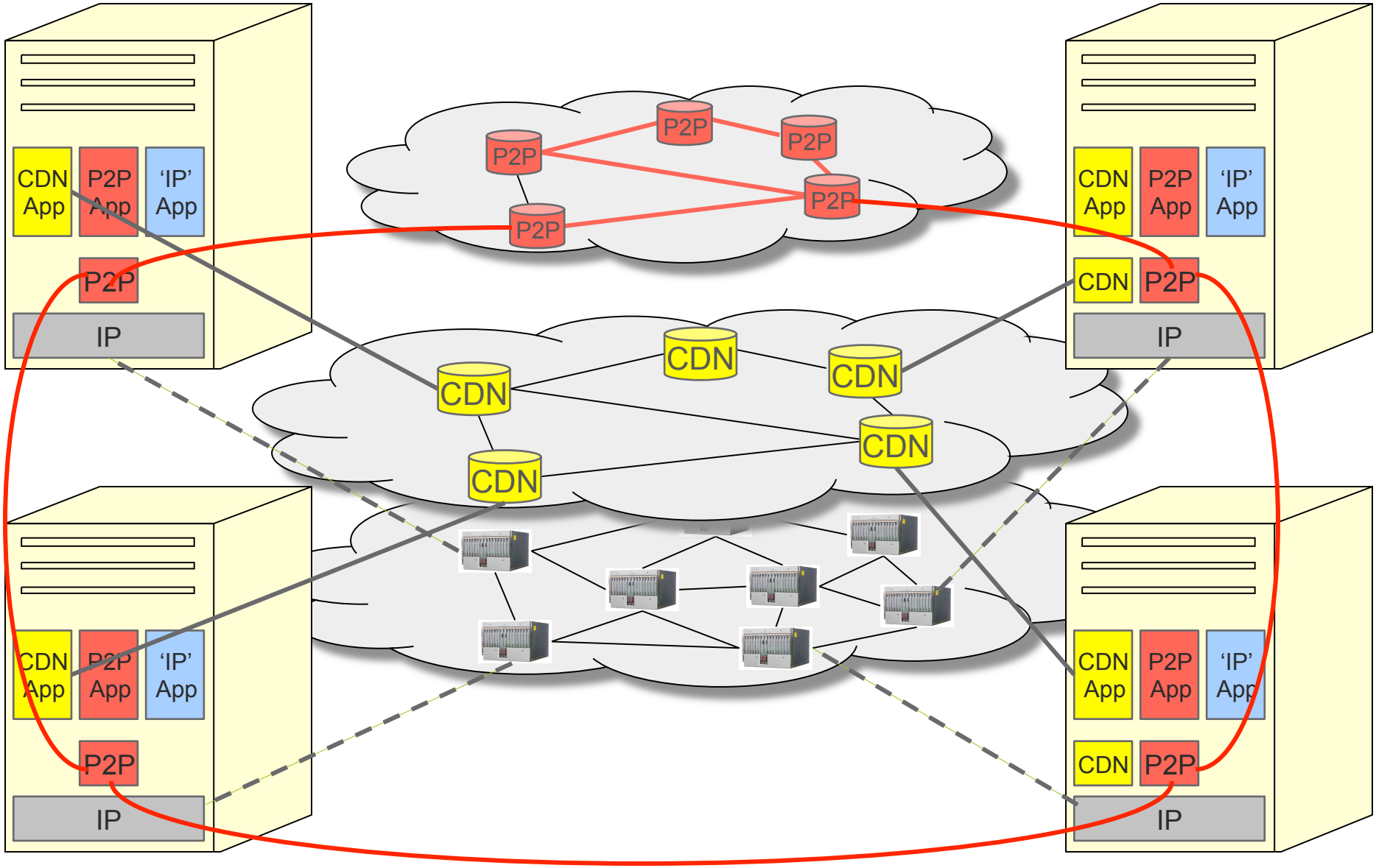
Future
Information Centric Network

Focus on
information objects and real world objects

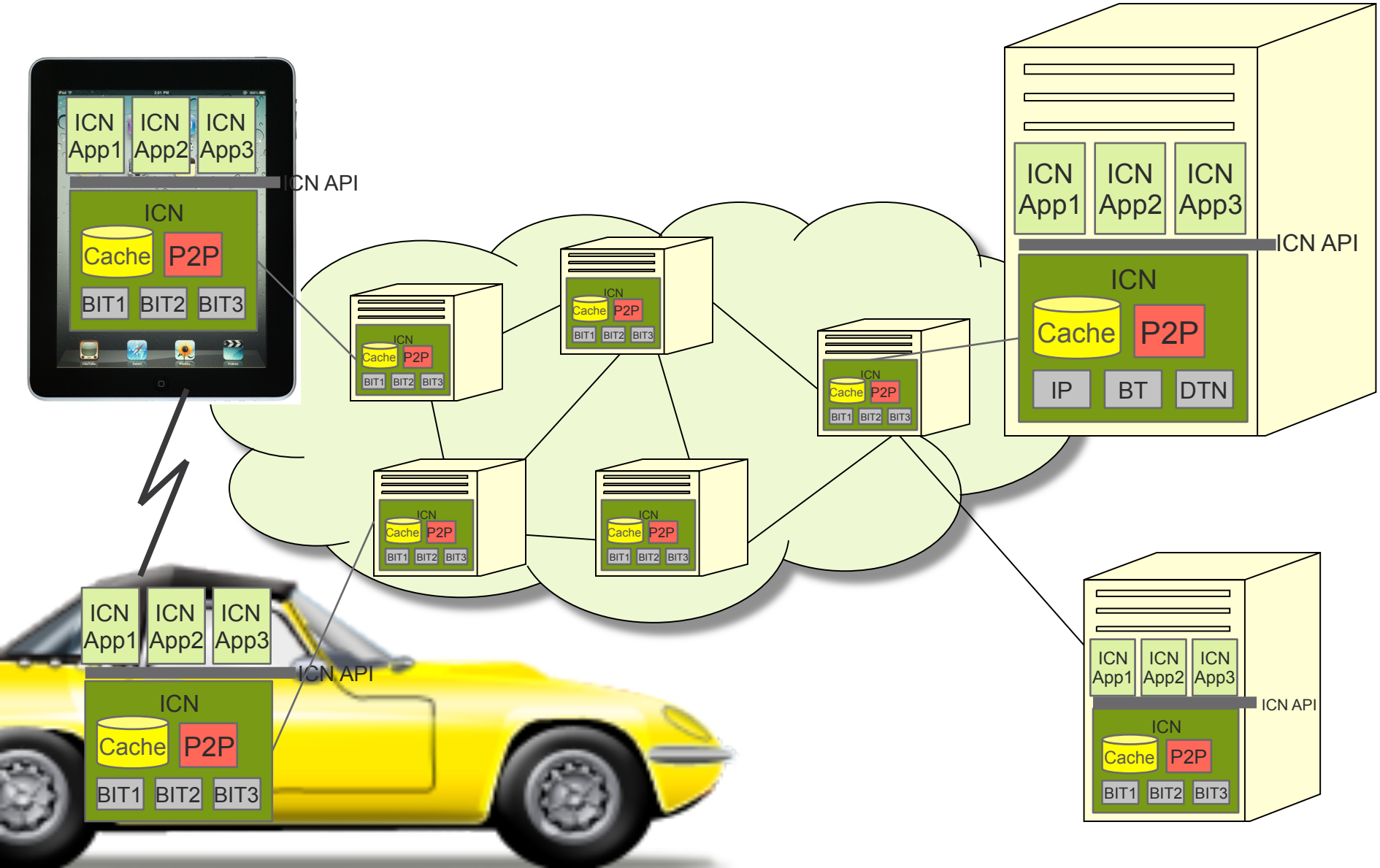


In today's Internet, accessing information is the dominating use case!

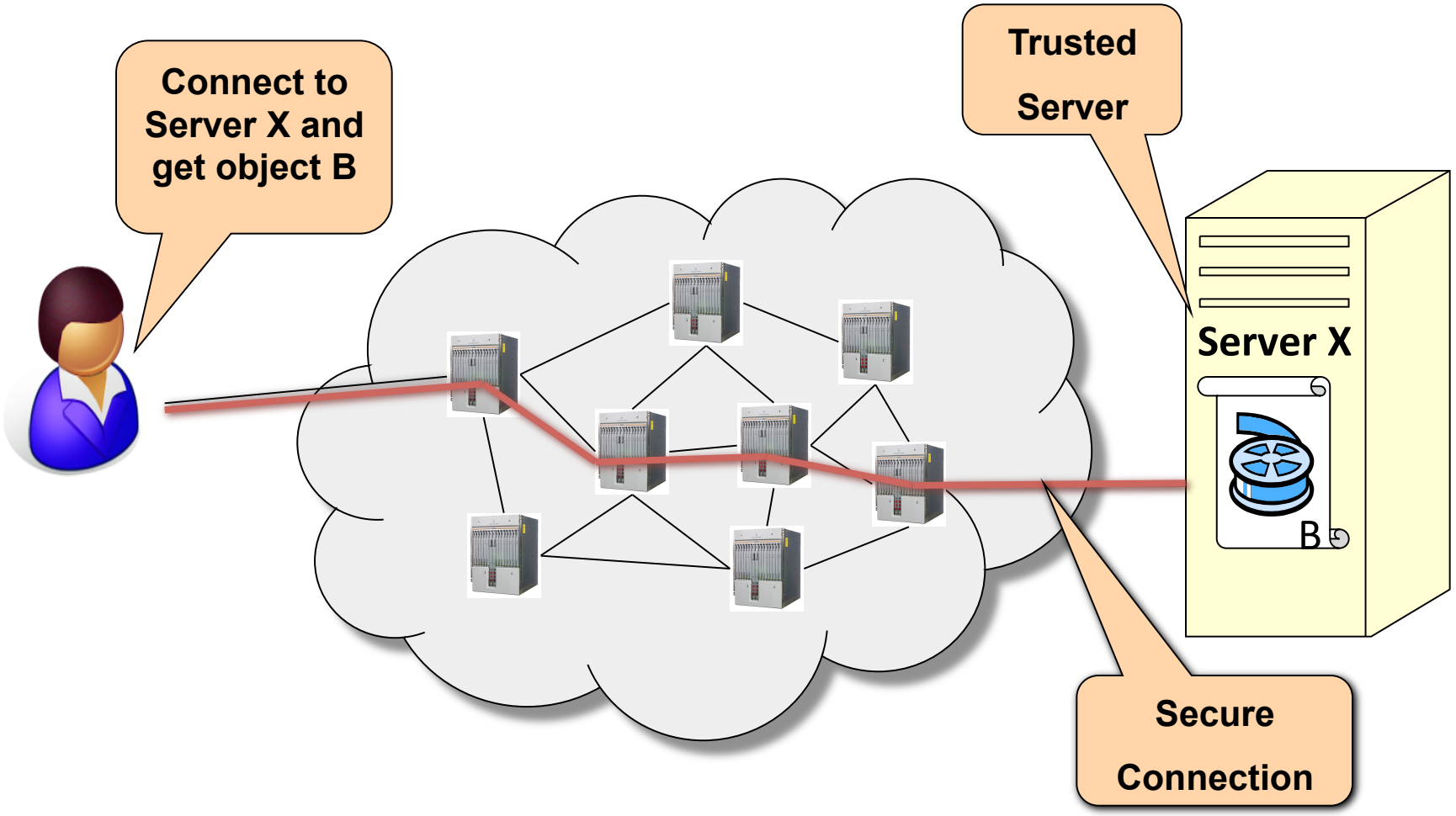
Host-centric networking



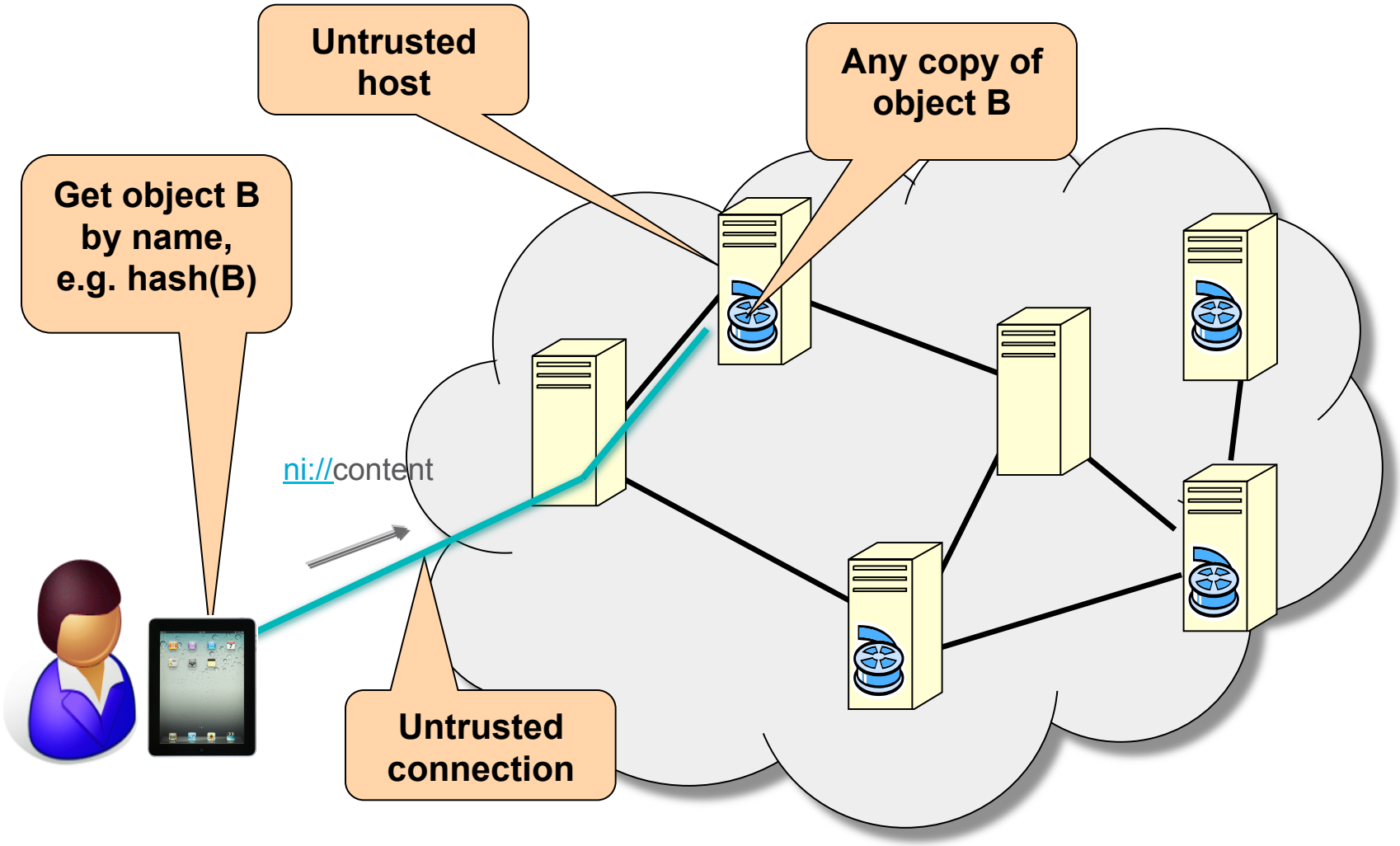
Information-centric networking



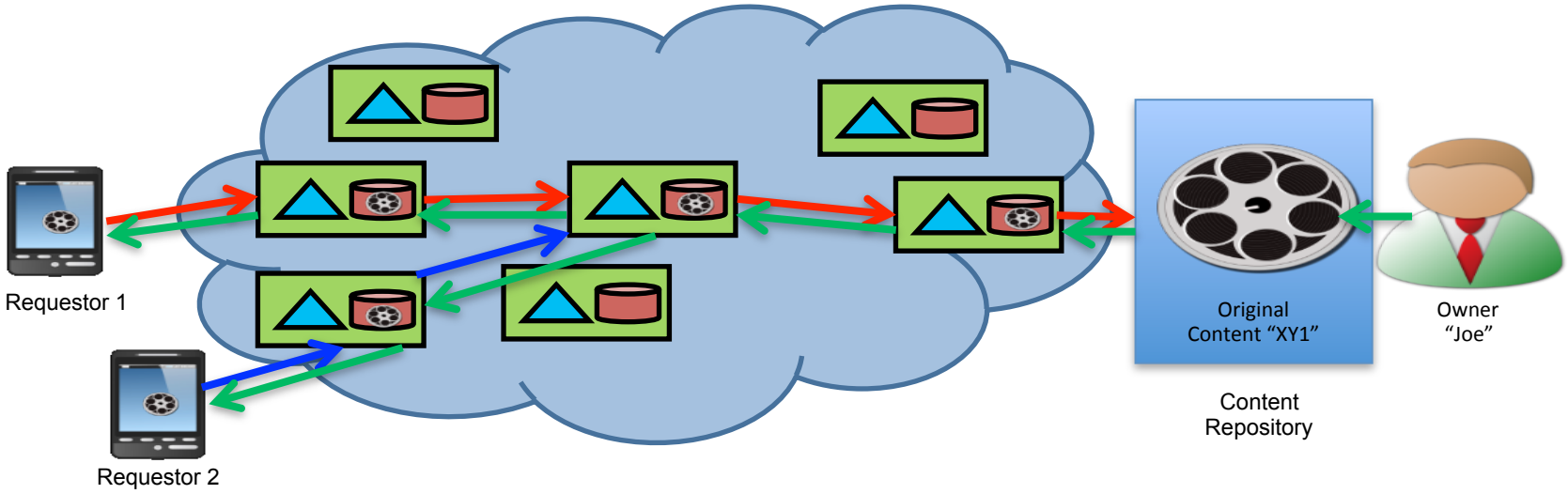
Host-centric networking – security model: trust and secure tunnels



Information-centric networking – security model: name data integrity



ICN Core Properties



- Named Data Objects the primary network component
- All copies are equal
- Request aggregation
- Name data integrity

ICN & ICNRG history and major events

- First bar-bar-BOF at IETF80 in Prague
- First meeting as an official IRTF RG at IETF84 in Vancouver
  - Around 80 participants at ICNRG meetings
- ICNRG Interim meeting Stockholm February 14-15, 2013
  - Hosted by Ericsson & ICT Labs
  - About 30 participants
- ICN established as research field
  - Workshops on ICN
    - SIGCOMM 2011, 2012 & 2013
    - Infocomm 2012 & 2013
    - Dagstuhl seminars 2010, 2012 & 2014
  - Preparing for stand alone ACM conference on ICN in 2014
  - ICN as feature topic in the July 2012 and December 2012 issues of IEEE communications magazine
- Standardization
  - ni naming – standard for naming data objects with hashes
    - Approved for becoming standards track RFC (in the RFC editors queue)
    - Adopted by the IETF core WG

ICNRG Objectives
(condensed version)

- Main objective: **Advance the state of ICN research**
- Forum for **exchange** and analysis **of ICN research ideas** and proposals
- Provides **guidelines for experimental activities** to be able **to compare alternative solutions consistently**.
- Investigate components of a **common protocol framework for ICN**, aiming to identify key **architecture invariants** across different specific approaches and protocols for future standardization.
- **Foster the development of ICN testbeds** for performing experiments with running code.
- Initiate discussions about **ICN interfaces** to the **application layer**, from network **management** systems, etc.
- Resulting in a **common protocol framework** for standardization. These protocols may or may not re-use existing IETF protocols.

ICNRG documents

- ICNRG is currently working on three documents
  - Survey
  - Research challenges
  - Scenarios and evaluations

ICN Survey document

- Document Purpose

- A survey about possible directions for the evolution of ICN solutions.
- Reach a general consensus about the nature of the ICN paradigm
  - what are ICNs
  - what should ICNs be and who are the stakeholders
  - Analyze major architectural approaches for the instantiation of the ICN paradigm, ending up with the identification of several design choices.

ICN Survey document
- Table of Contents

Research challenges document
- Document Purpose

- WHY
  - Problems and pain points in today's networks
- HOW can ICN help
  - Fundamental ICN concepts
- WHAT to do in ICNRG
  - Research challenges, important topics
- Possible RESULTS
  - Impact on IETF work

Challenges document
- Table of Contents

ICN Baseline Scenarios document

- Establish a common understanding about potential experimental setups (testbed and simulation)
- Provide equal ground for comparison, an agreed framework
- Scenarios should be general enough and “technology agnostic”
  - Scenario detail may vary
- Aim to get feedback from implementers, both on the scenario definition and level of detail
- All approaches need not implement all scenarios
  - but all scenarios should end up illustrated in a real demo

ICN Baseline Scenarios document
- Table of Contents (1/2)

ICN Baseline Scenarios document
- Table of Contents (2/2)