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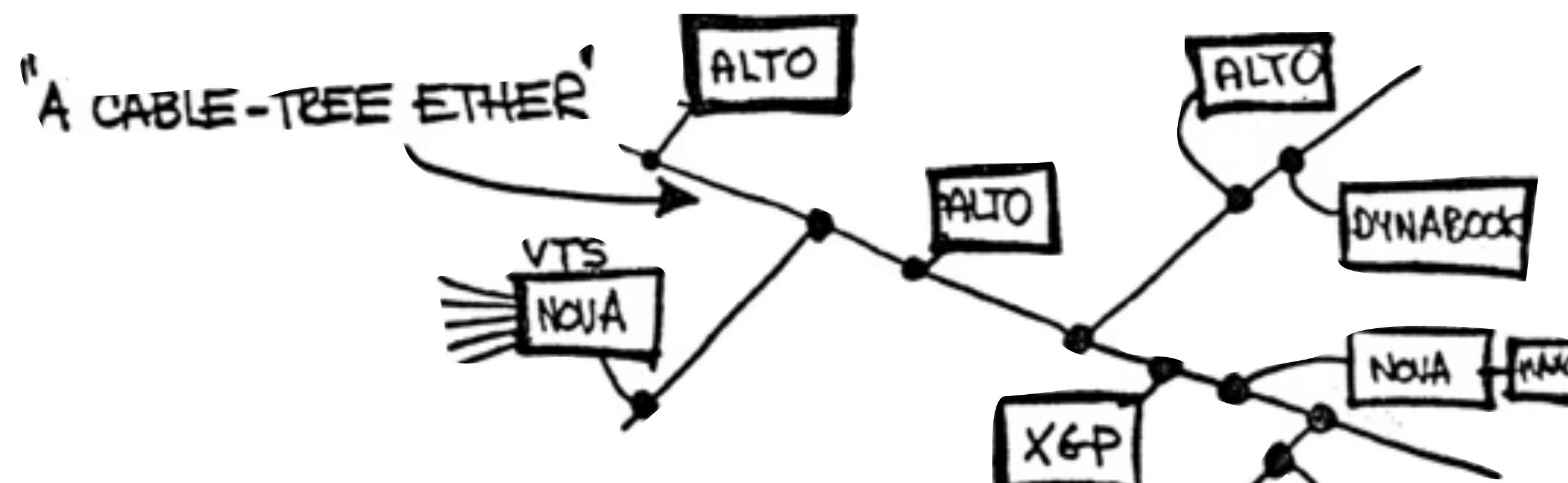
# Driving the next generation Internet

Glenn Edens  
Vice President

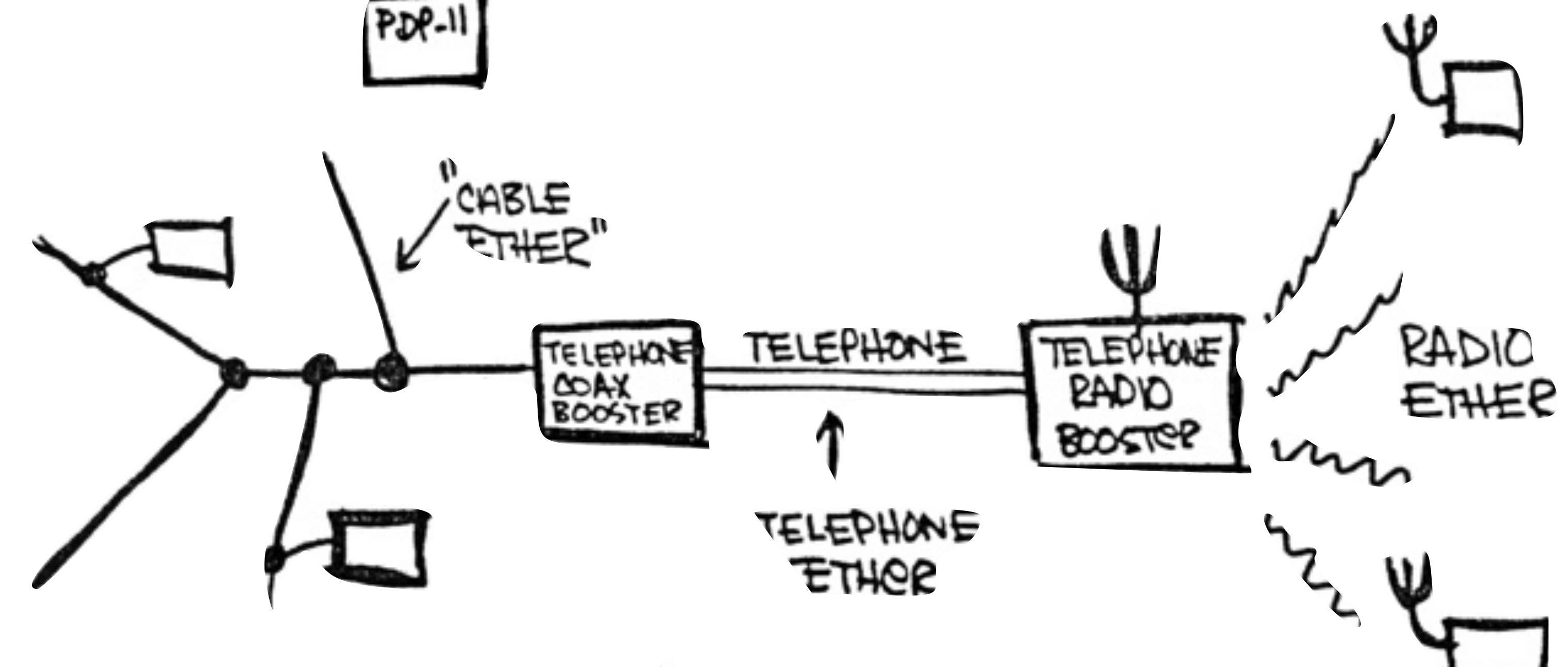


# Vision

# Change, disruption, innovation



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# Why CCN?

**The Internet is broken**

An explosion of **traffic**

An explosion of **devices**

An explosion of **complexity**

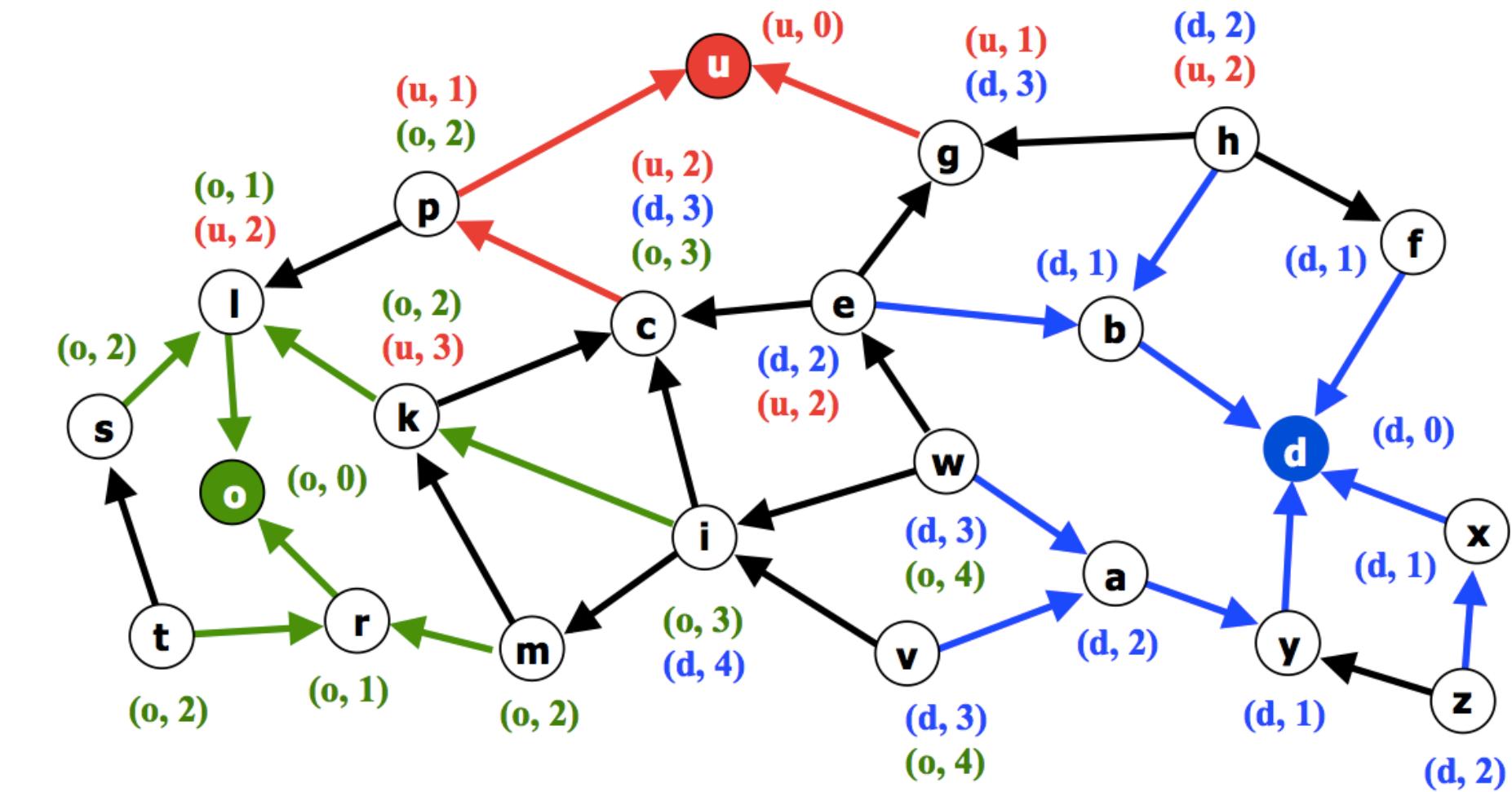
An explosion of **security failures**

An explosion of **protocols & formats**



# Why CCN?

# We can fix it



CCN is a networking protocol that can work with or replace IP

CCN is a middleware stack to move functions from operating systems to the network, applications can be built on it

CCN is a distributed storage and computing creating a scalable & secure 21st Century architecture at global scale

# Internet challenges



## Data Center

High speed data transfers  
between nearby nodes

## Internet of Things

Data collection, sensing and  
actuation on small devices

## Web

Efficient and secure  
communication channels

## Enterprise

Isolation, management, access,  
audit and compliance

## Ad-hoc / DTN

Non-traditional edge networks  
with no infrastructure

## De-centralized Applications

New network abstractions to  
deal with communication



rethink the network  
rethink the stack

# CCN overview

## Step 1 - Name the data

Name every piece of network data

## Step 2 - Secure the data

Secure every piece of network data

## Step 3 - Transfer the data

Move the data to interested recipients

# The CCN architecture

## **Applications**

User facing programs

## **Services**

Base services required for network operation

## **APIs**

Abstractions for interacting with the network

## **Transport**

Structured and secure “end-to-end” communication

## **Messaging**

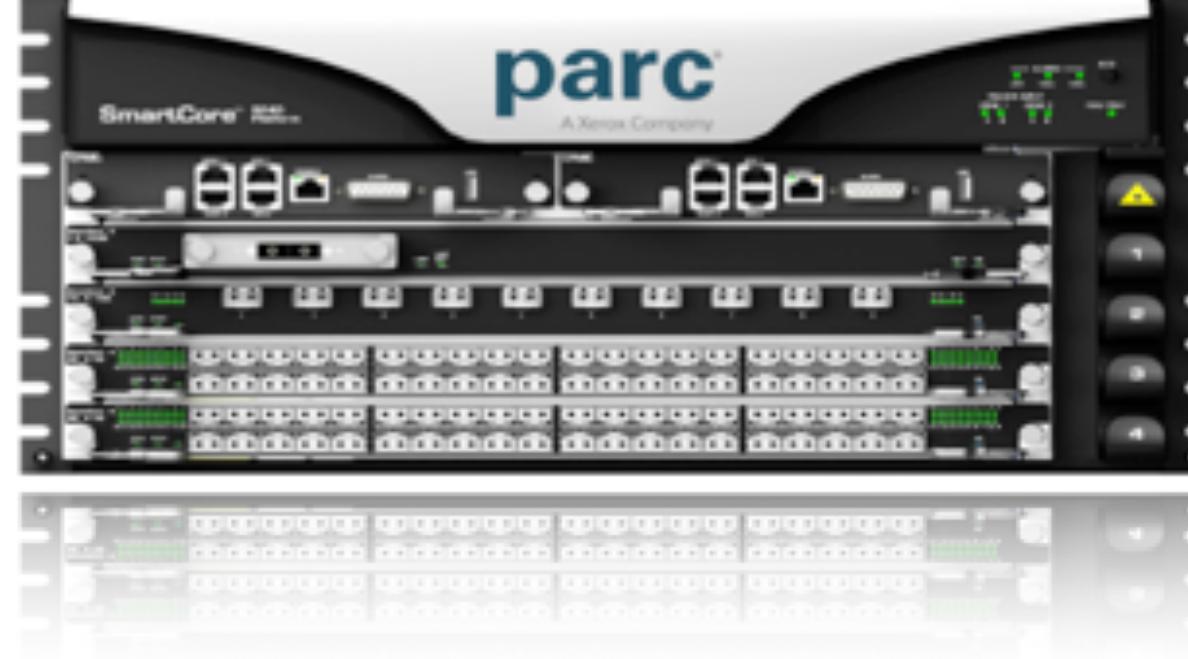
Name-based, network wide communication using CCN messages

## **Framing**

Transport for messages over layer 2



# The CCN project



## **Specifications**

Description of protocols and algorithms

## **Software**

Reference software implementation

## **Hardware**

Hardware prototypes (big and small)

## **Commercial community**

Commercial companies developing CCN

## **Research community**

Researchers, faculty and students working on the CCN technology

## **Developer community**

Application developers (big and small) using CCN

# CCN Benefits



## Security

Data is always secure, in transit and at rest.

## Control

The network works in conjunction with the clients

## Interoperable

Applications can interoperate transparently

## Resilience

The network can operate with minimal interruption

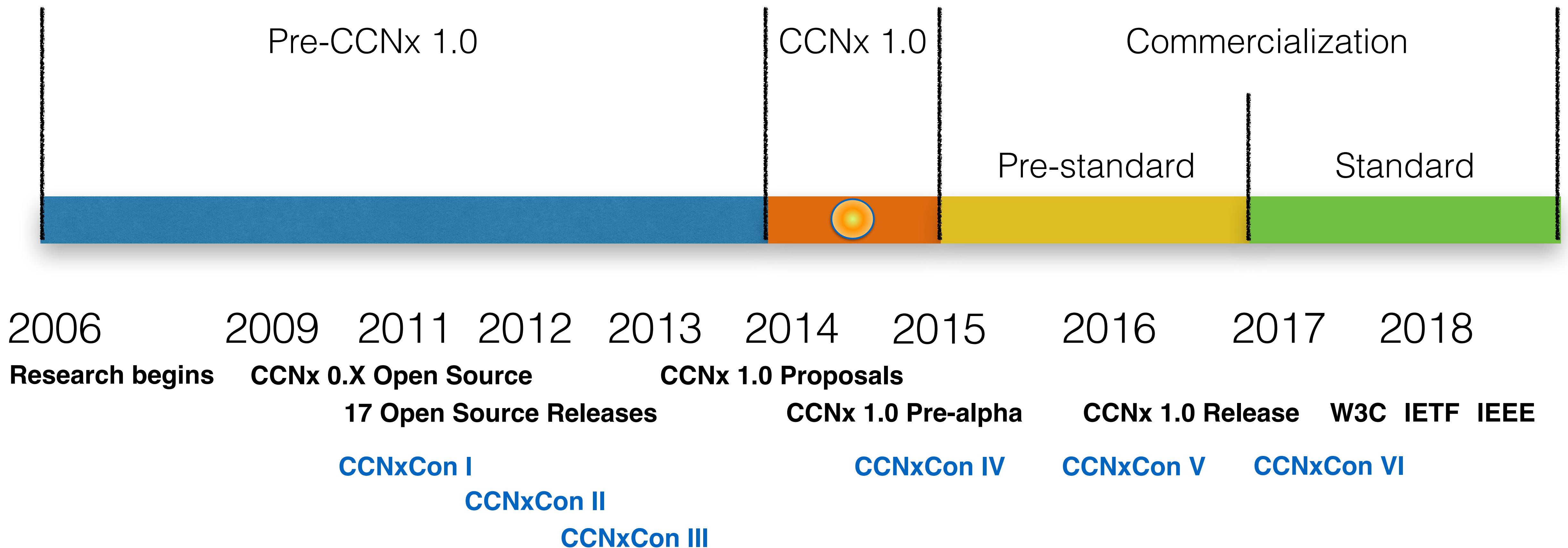
## Efficient

Low overhead under heavy demand

## Composable

Integrate storage, communication, processing

# CCN time line



# Why now?

Moving from research prototype to commercial prototype



Five years of experience building systems and PoCs for a wide variety of clients (Government and commercial)

Hundreds of institutions using our pre-1.0 code and thousands of researchers and developers = a lot of feedback

Collaboration with academia, PI/PM for first phase of NSF FIA

Partners have orders for CCN-enabled products

# How to join us?



**Academic Program** - targeting December, access to code, tools, documentation and 'as available' support via PRTEL

**Supply-side Programs** - being defined now, soliciting feedback and working to advantage early adopters and early collaborators

**Demand-side Programs** - defined early next year, SDKs and PoC tools to network operators, enterprises and startups

**IP Licensing Programs** - we are listening

# Upcoming events

September 24 — CCNx 1.0 Tutorial at ACM ICN 2014 Paris

October 21 — CCNx Workshop, Palo Alto

December 2014 — CCNedu workshop & webinar

February 13, 2015 — *“The Future of the Internet: Meaning and Names or Numbers?”* AAAS Annual Meeting - Vinton Cerf, David Oran, JJ Garcia-Luna-Aceves and Glenn Edens, San Francisco

May 18-21, 2015 — CCNxCON IV, Palo Alto

September 30 — ACM ICN 2015, Hyatt Regency, San Francisco



# Vision

## Change, disruption, innovation

**New business models, new equipment value, new applications value**



*“A point of view is worth 10 IQ points”*

*“The best way to predict the future is to invent the future”*

– Alan Kay



*“The value of a network is proportional to the square of the connected users of the network”*

*“I didn’t make money inventing Ethernet, I made money selling Ethernet”*

– Bob Metcalfe



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**Thank you**