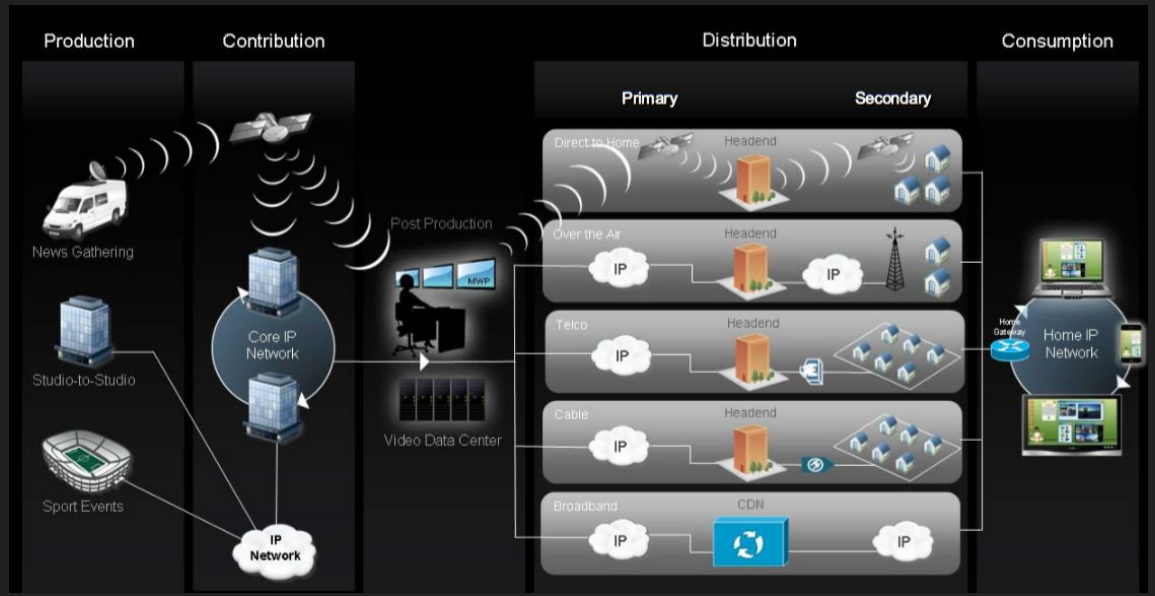
# Cable Headend Virtualization Testing Application

By Paul Kelly

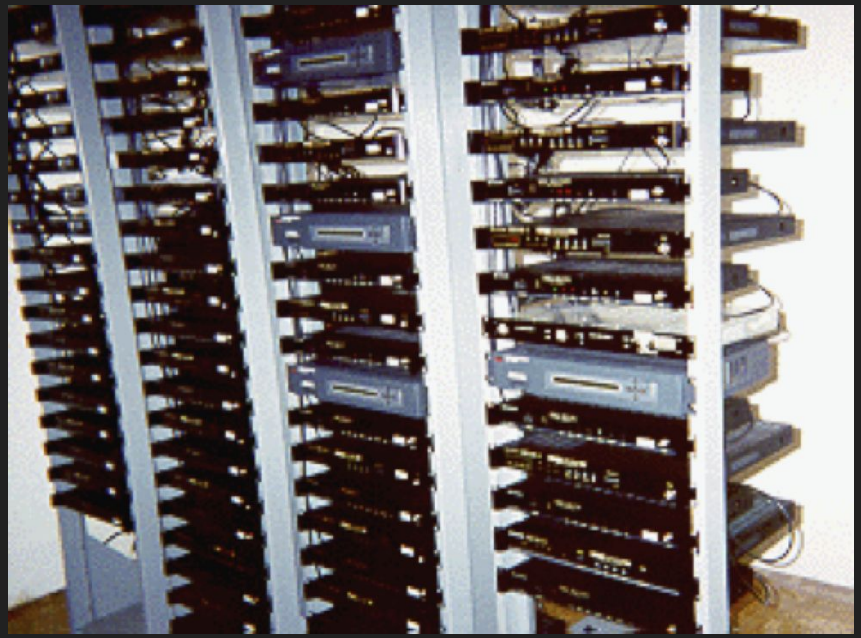
# Concept

Cable headend systems re-distribute video from a source or multiple sources to a network of cable subscribers



# Concept

Cable headend systems can be bulky



# Concept

Cable headend hardware must be built specifically for each channel distributed

Difficult to keep spares

# Concept

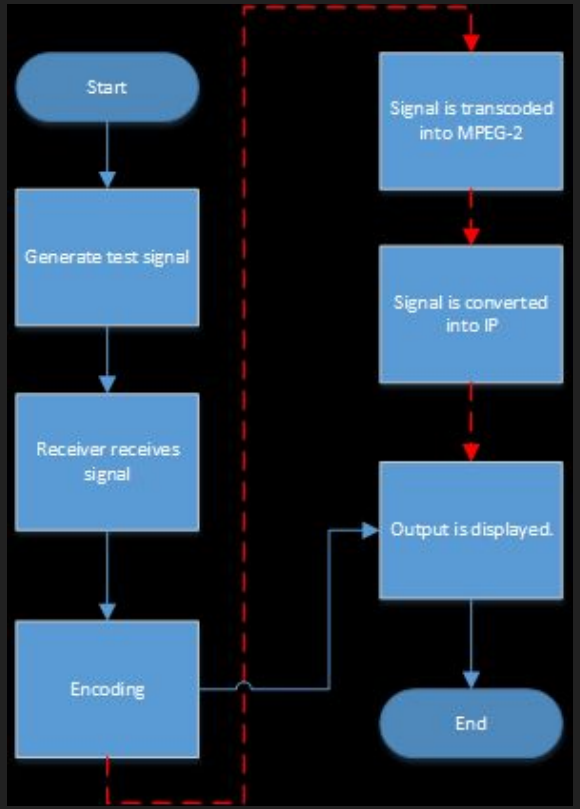
Hardware can be simulated, or virtualized on a reprogrammable FPGA board

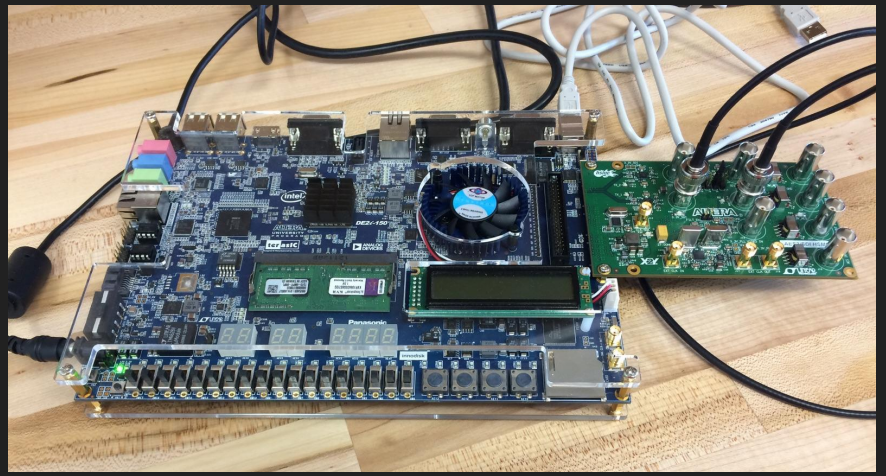
Virtualized hardware should reduce space, should be able to contain multiple components, and should be faster than real hardware

# Goals

1. Proof of concept
2. Generate encoded test signal to validate proof
3. Make enough progress so that another team can continue the work and test a real system in future semesters

# Architecture



# Key Achievements

- Board is receiving the unencrypted signal
- Encryption is yet to come
- Decryption up and running

# Photo credits go to...

- Cisco Digital Headend Solution by Bojan Nedelcev
  - Headend diagram
  - Single Headend box
- http://jpa1.com
  - Bulky headend system
- https://gigaom.com/2015/02/23/microsoft-is-building-fast-low-power-neural-networks-with-fpgas/
  - Altera Chip
- Paul Kelly
  - Flowchart
  - Altera board with SDI cables

# Any questions?

Credits: Star Trek TNG: Encounter at Farpoint