

A Modern and Practical Approach to Content Delivery

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Agenda

About me

Increasing internet traffic

CDN technology landscape

Hyper-local content delivery

Agenda !



About Me

Jaimon Jose, Co-Founder, CTO, picoNets

- 17 Years of product development experience
- Distinguished Engineer at Novell and Core founding member at PAQS
- Continuous learner and Trainer for processes and technologies over a decade
- Engaged with academia and industries
- Patents, publications and speaking in various events
- Over a decade of experience in building solutions in identity, security, cloud, virtualization, distributed systems



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CDN - Overview

Content Delivery Networks (CDN) improves network performance by maximizing bandwidth and improving accessibility through content replication.

Content is replicated to many edge servers (PoP) placed close to users

Common services offered

- Request routing
- Content delivery
- Content distribution
- Accounting
- On demand purge
- Added web security



The Zettabyte Era

Annual global IP traffic will pass the zettabyte threshold by the end of 2016, and will reach 2 zettabytes per year by 2019

Content Delivery Networks will carry nearly two-thirds internet traffic by 2019

Two-thirds of all IP traffic will originate with non-PC devices by 2019

Globally, IP video traffic will be 80% of all IP traffic by 2019, up from 67% in 2014

Internet video to TV to double by 2019

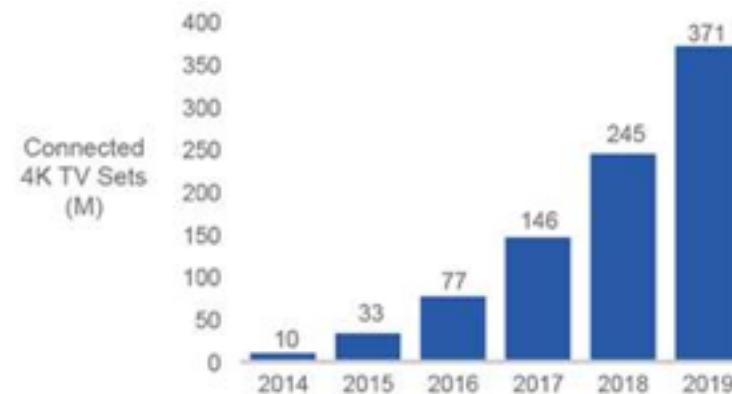
Consumer VoD traffic will nearly double by 2019

Source: Cisco Virtual Networking Index, 2015



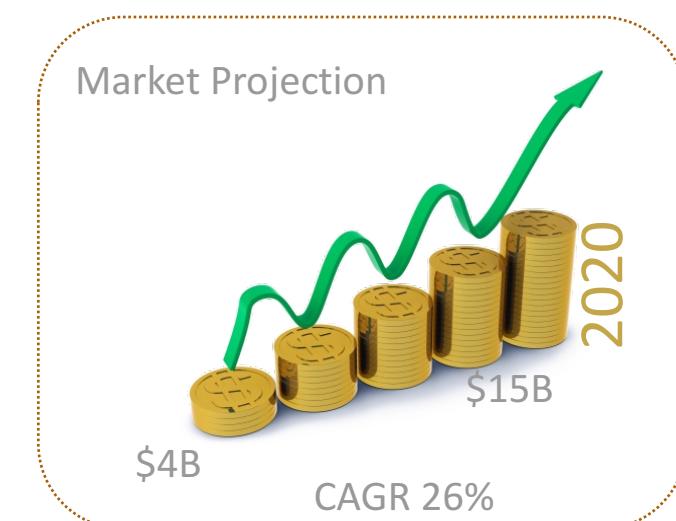
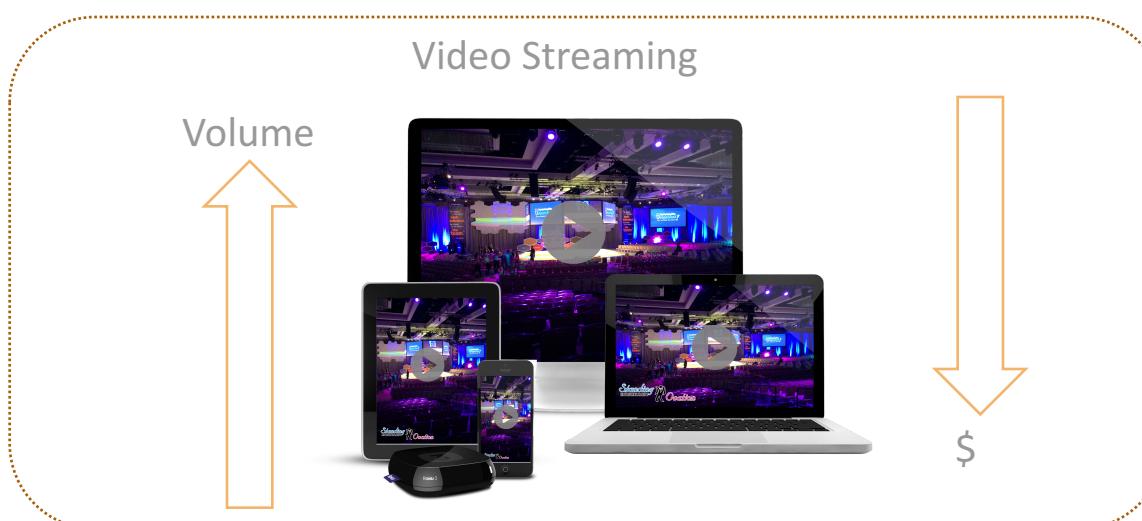
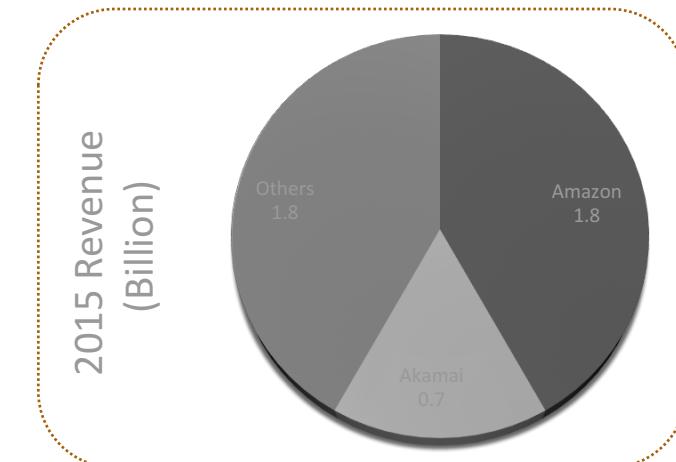
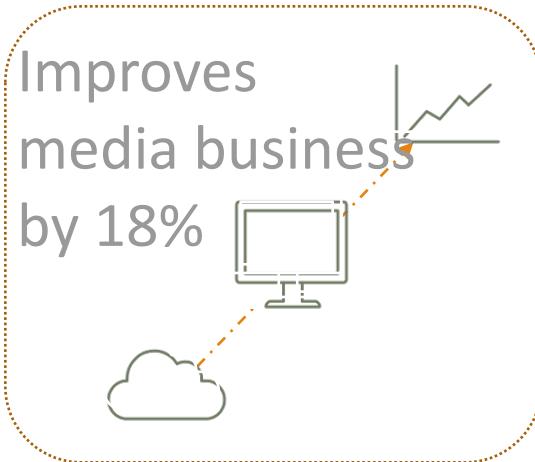
Increasing Video Definition

More than 30% of connected Flat-Panel TV Sets will be 4K by 2019





Current CDN Landscape





Three Phases of CDN Evolution

Traditional

Owns your network and DNS

Highly optimized routes to origin servers

Expensive to maintain

Eg. Akamai

AnyCast

Evolved since 2006

More efficient due to built in network intelligence

Highly dependent on ISP due to AnyCast setup

Eg. CloudFlare

PeerCDN

Based on WebRTC hence very new

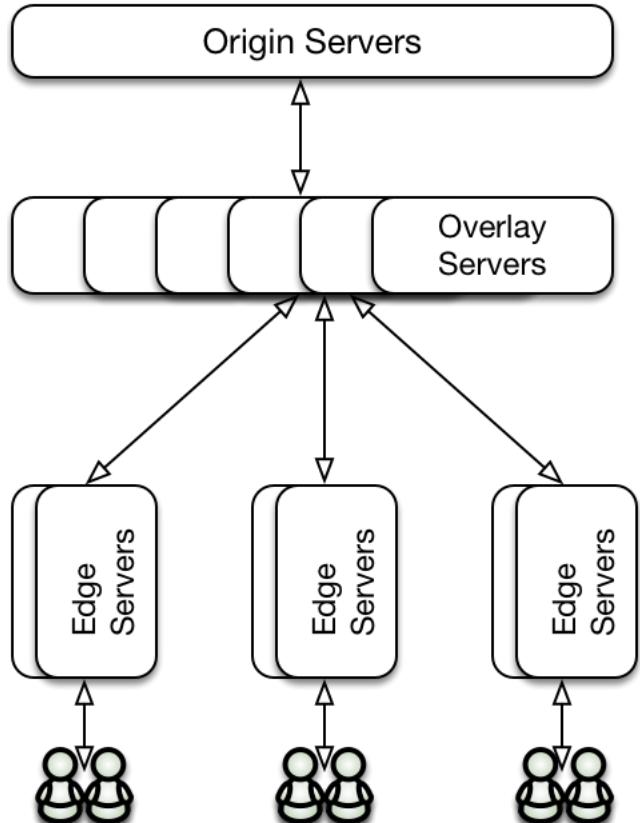
No dependency on last mile ISP

No limitations on PoP as virtually every consumer is also a cache

Eg. peer5, streamroot



CDN Layers



CDN composition

- CDN architecture approaches
- Servers
- Relationship, interaction protocols etc.

Content distribution and management

- Edge server placement

Request routing

- Process of redirecting a client request to an edge server

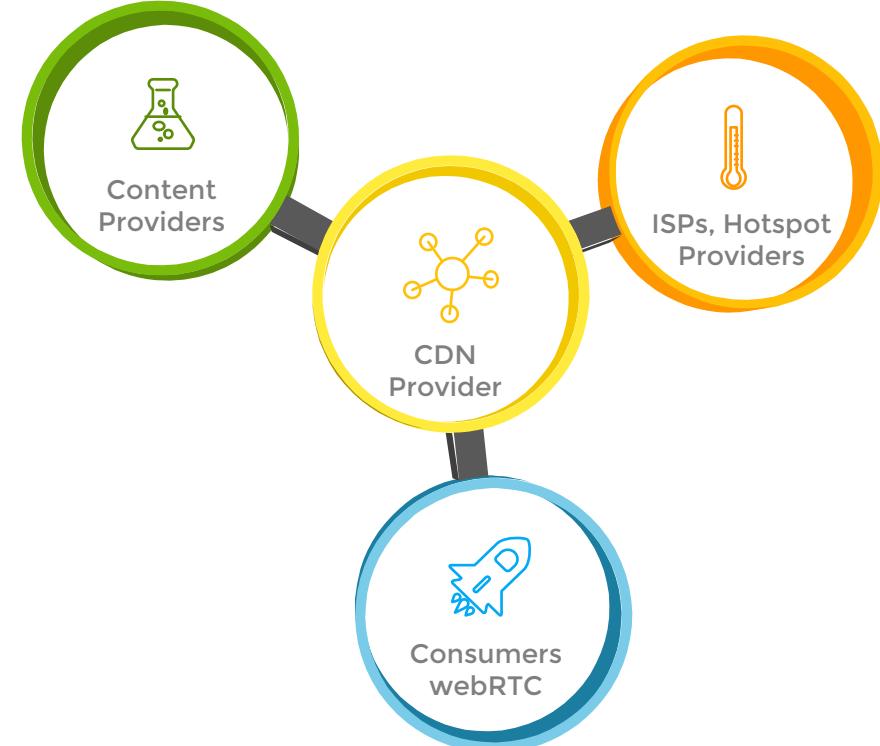


Alternate Approaches

Leverage the high penetration of high speed networks

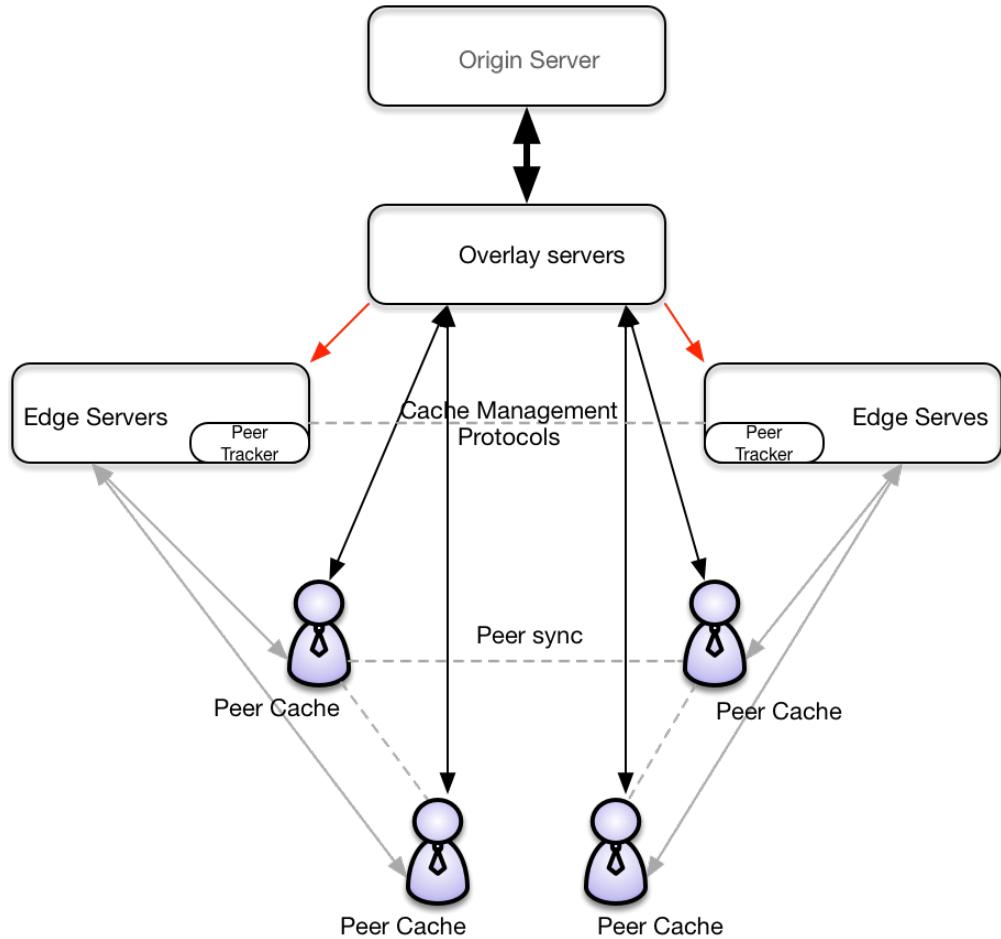
Self managed P2P networks at the last mile

- More fault tolerant and scalable
- Relies on the last overlay servers and not-so-critical edge servers for missing objects
- Number of nodes coming up in an environment will be directly proportional to popularity of the content.





Peer Assisted – Crowded Sourced Delivery



Overlay servers

- Reduce the load on content providers infrastructure.

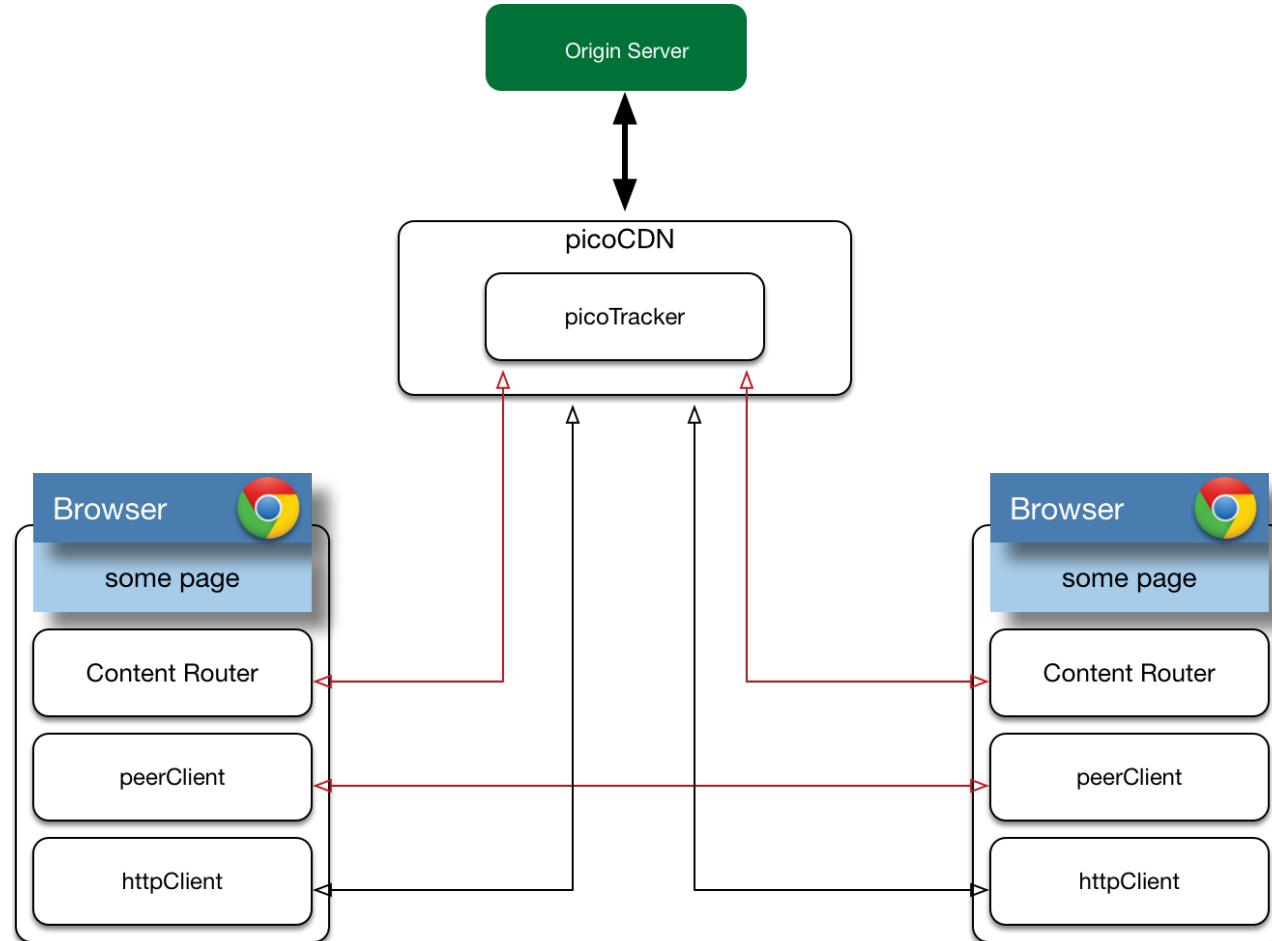
Sparse edge servers

- Distributes content from overlay servers using a nearest neighbor content discovery algorithm

Peer cache

- Torrent style peers that shares content with each other.
- Placed close to consumer, large in numbers.
- Tracked and managed using a elected tracker in the network

peerCache



peerCache

Built on Websockets and WebRTC

- Connects to peers holding the same content and backend picoCDN for fetching fresh content

WebRTC benefits

- NAT traversal
- No CORS (Cross-Origin Policy)
- Mandatory encryption
- Universal WebRTC data channel

Ideal for P2P networks

peerCache Benefits

Faster to get content from friends and neighbors in the same network

Resource registry using WebSockets

- Faster, can send WebRTC offers and receive WebRTC answers

Reduced bandwidth usage

Supported on major browsers and mobile platforms

Keep the registry open to receive remote offers

Questions?



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