

Title	Prototyping and evaluating SDN-based multicast architectures for live video streaming [poster presentation]
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Publication date	2017-10
Original Citation	Khalid, A., Zahran, A. H. and Sreenan, C. J. (2017) Prototyping and Evaluating SDN-based Multicast Architectures for Live Video Streaming [Poster Presentation] 42nd IEEE Conference on Local Computer Networks (LCN) Singapore, 9-12 October.
Type of publication	Conference item
Link to publisher's version	https://www.ieeelcn.org/prior/LCN42/Program_demos.html , http://hdl.handle.net/10468/5309
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Download date	2025-04-21 23:49:01
Item downloaded from	https://hdl.handle.net/10468/5308



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Prototyping and Evaluating SDN-based Multicast Architectures for Live Video Streaming

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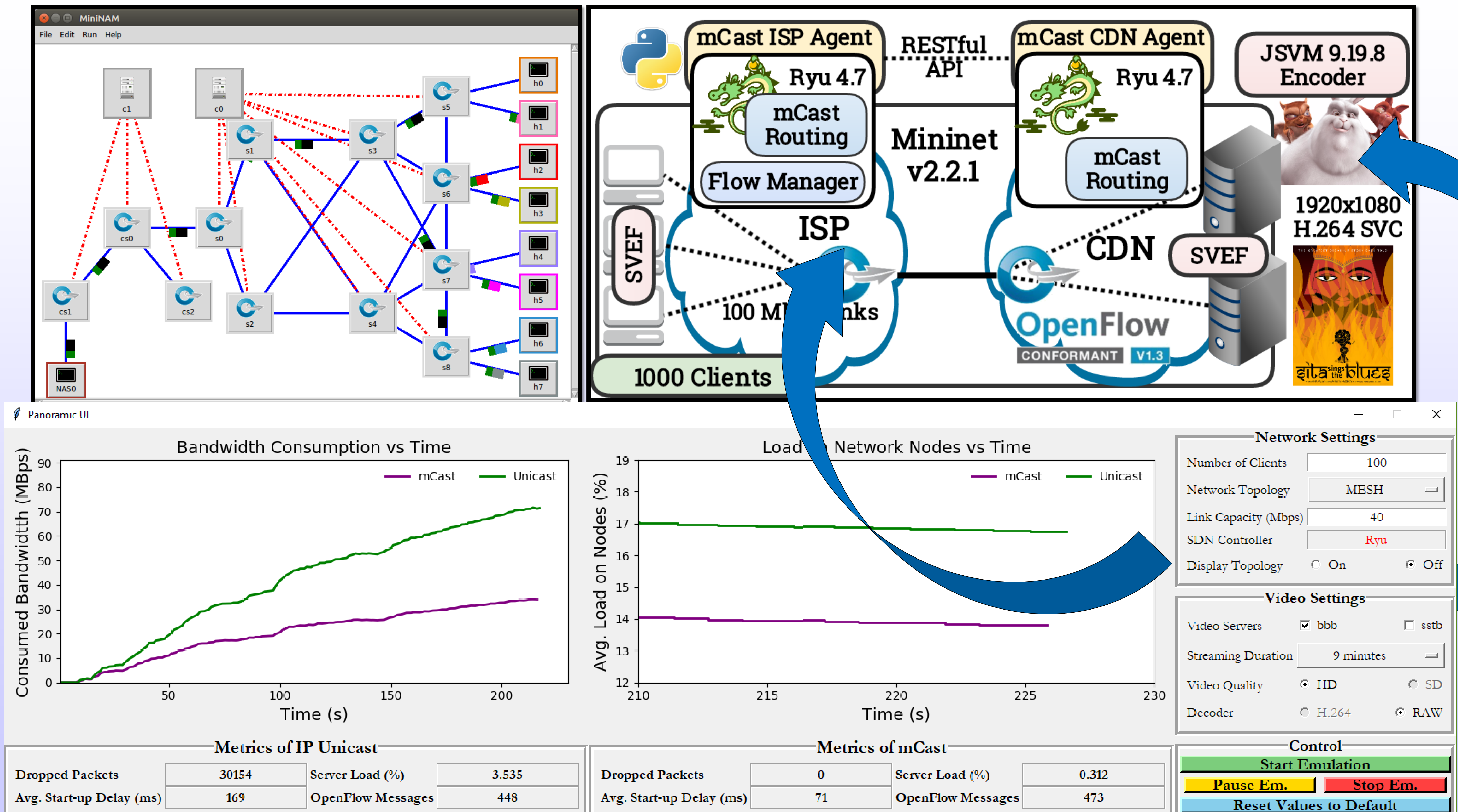


Introduction

Significance: Internet video to TV will continue to grow at a rapid pace, increasing 3.6-fold by 2020. Live video streaming services constitute of **40 percent** of consumer Internet video traffic. [Cisco2015]

Contribution: A generic platform to evaluate and compare various SDN-based multicast architectures or algorithms. Benchmark the performance against standard IP unicast. Provide a mechanism to modify various evaluation parameters and **monitor the effect on output** in form of graphs and live statistics. **Implement a prototype of mCast** and compare it with IP unicast.

Evaluation Platform: Testbed Setup and GUIs



mCast: An SDN-based Resource-Efficient Live Video Streaming Architecture with ISP-CDN Collaboration

Key Features

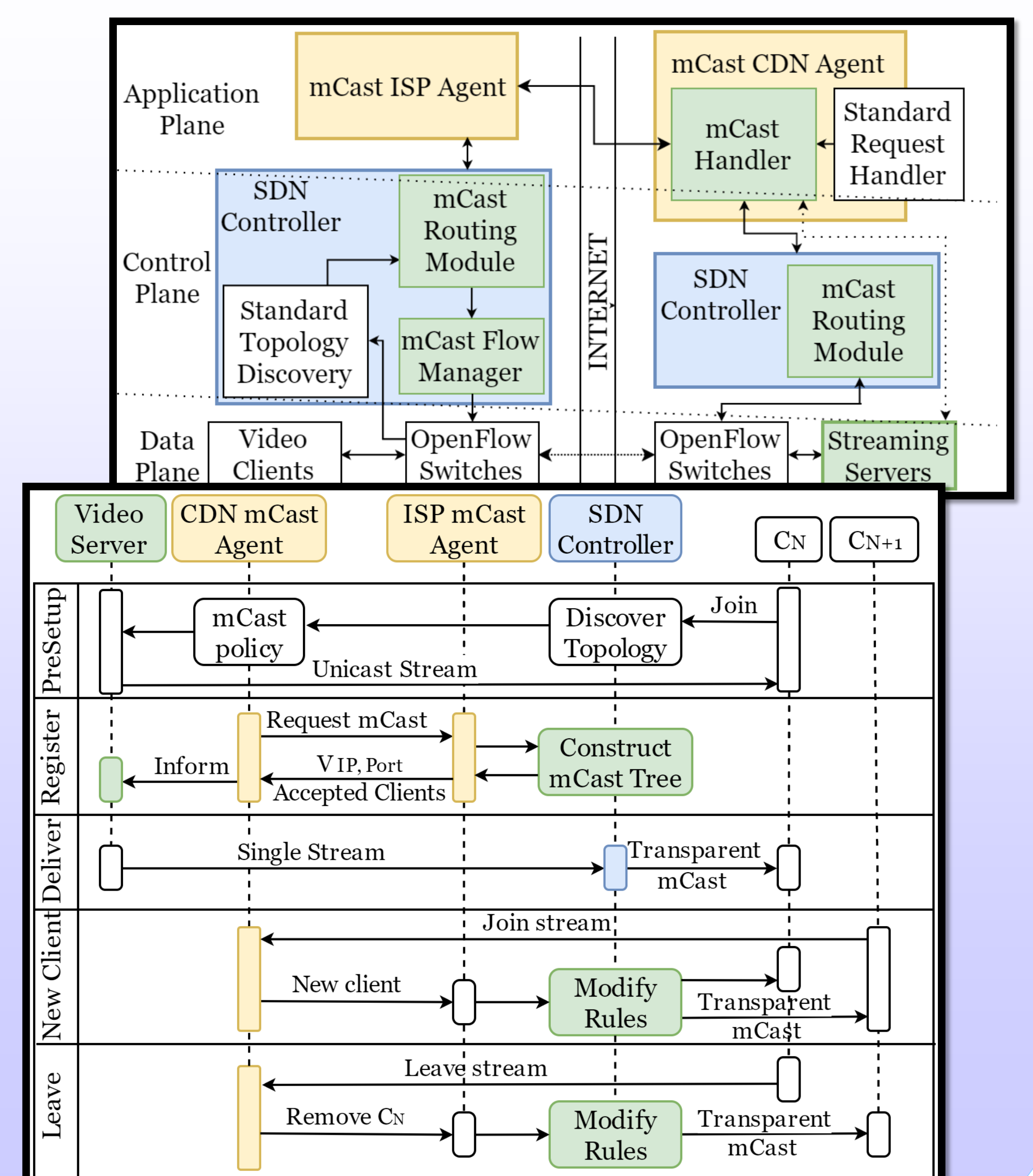
- Inter-domain** network layer multicast – Dynamic multicast tree construction
- Full control of CDNs** over their clients – **Transparent delivery** to clients

Components and Functions

- mCast CDN Agent:** Identifies clients and **triggers mCast**.
- mCast ISP Agent:** Interfaces with CDN and orchestrates mCast operations in ISP.
- mCast Streaming Server:** Implements an API to communicate with mCast CDN Agent.
- mCast CDN Routing Module:** Consults mCast CDN Agent before proceeding with the default routing.
- mCast ISP Routing Module:** **Constructs multicast trees** based on the routing logic.
- mCast Flow Manager:** Installs multicast entries in network nodes with **higher priority** than IP unicast and installs **transparency rules** on the egress switch.

Results and Benefits

- Reduced load on CDN servers - **Energy savings** for CDNs
- Reduced **inter-domain** and intra-domain traffic for ISPs - **Better video quality**



Evaluating other algorithms

The platform consists of **discrete scalable and reusable modules**, with every module independent of others. To implement any other algorithm, its code can be added to the relevant module of the platform as a **plug-in**. For very large scale evaluations, real-time statistics can be disabled and **logs can be gathered for post-processing**.

QR code for a link to details, examples and videos of the platform.

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