

# ***MADHYAM: A LOW -COST AND SCALABLE MODEL FOR EDUCATIONAL CONTENT DISTRIBUTION IN INTERMITTENT CONNECTIVITY ENVIRONMENTS***

Indian Institute of Technology Kanpur  
Commonwealth of Learning Vancouver



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# *Madhyam*

- A model for Educational Content Distribution in network-challenged environments
- Implemented the model and done feasibility study to deploy it in real scenarios

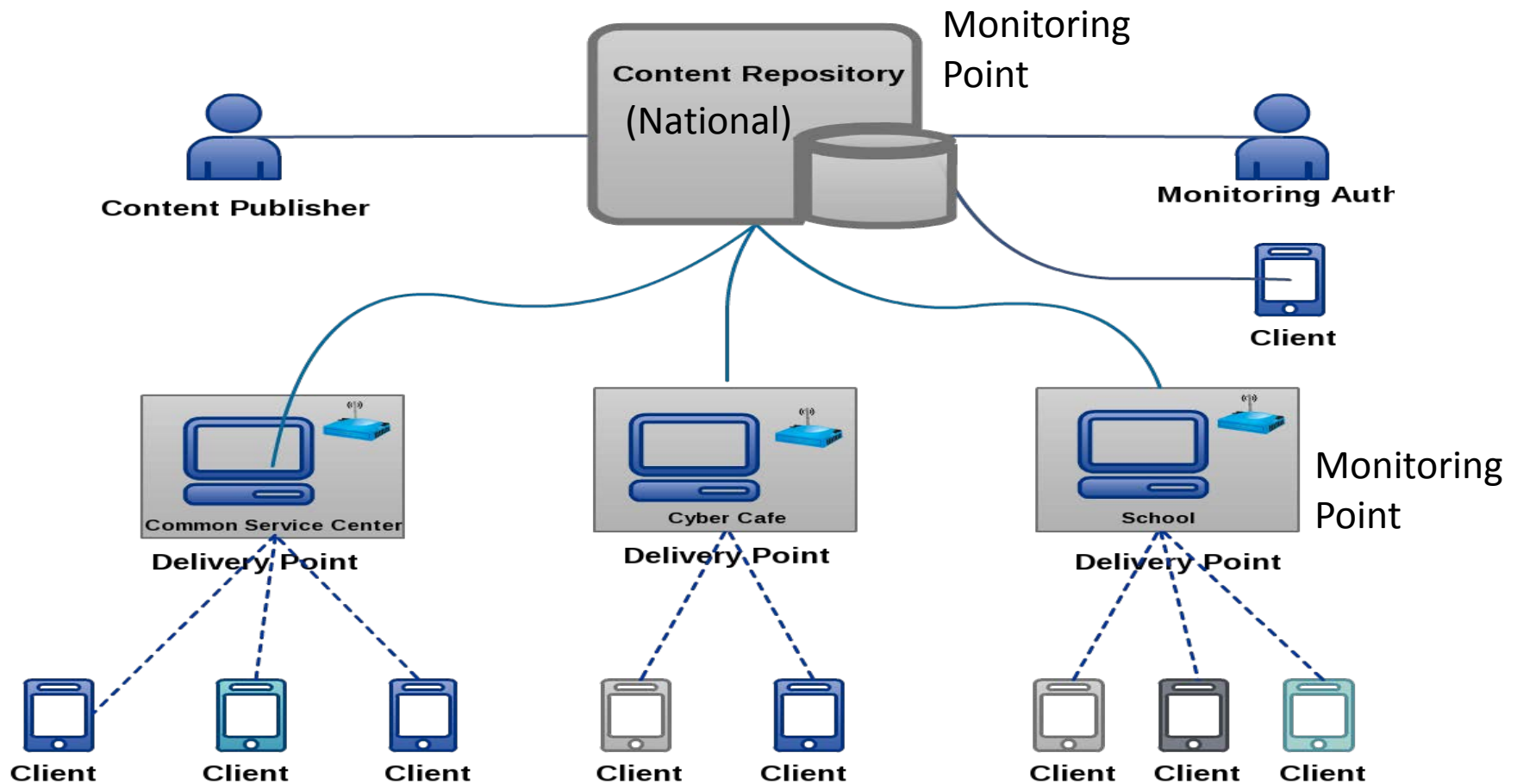
# What is available?

- Intermittent Connectivity in the area
- Mobile Devices with the learner
- Commodity Hardware

# Goals

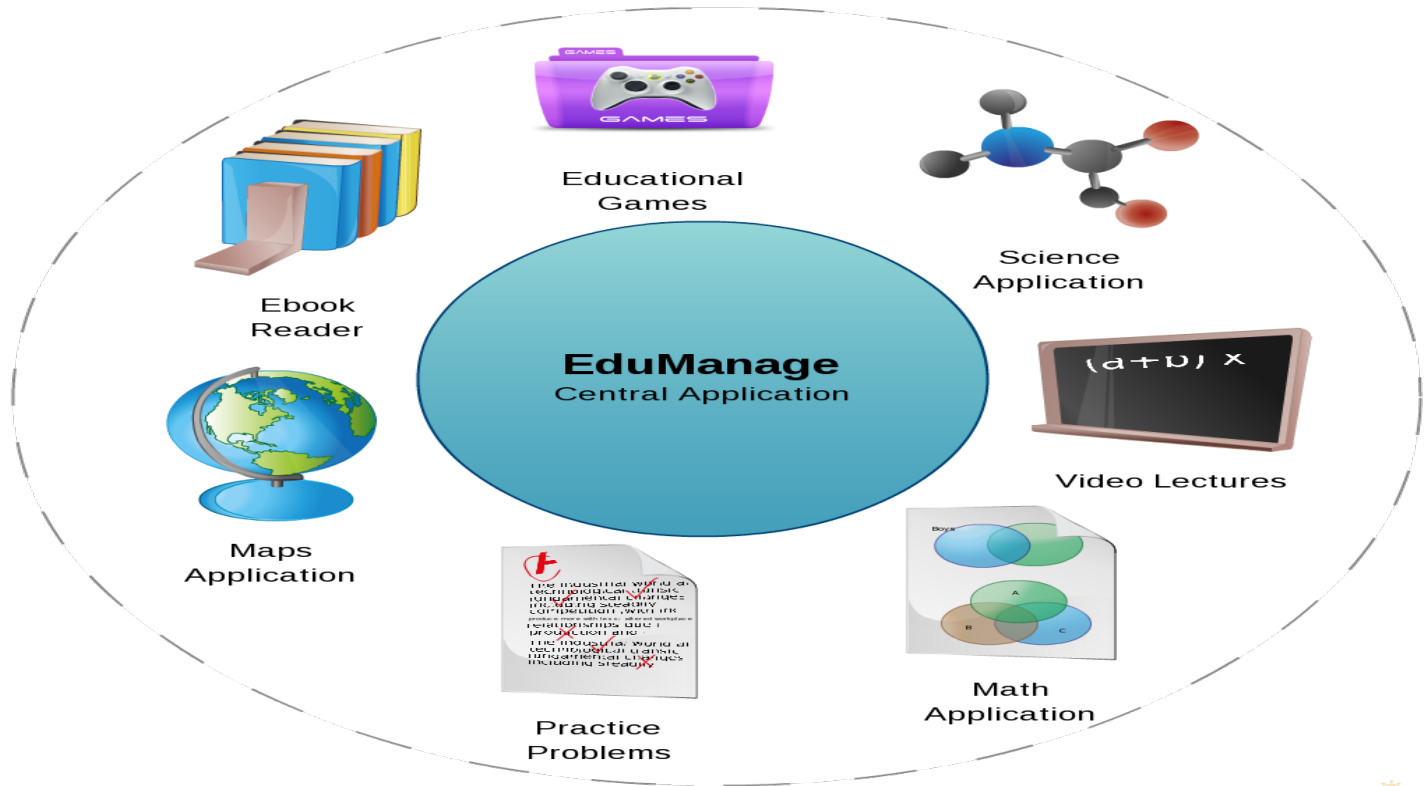
- Reach learning material to the student
- Help Decision making
- Reduce administrative and setup costs

# Conceptual Model

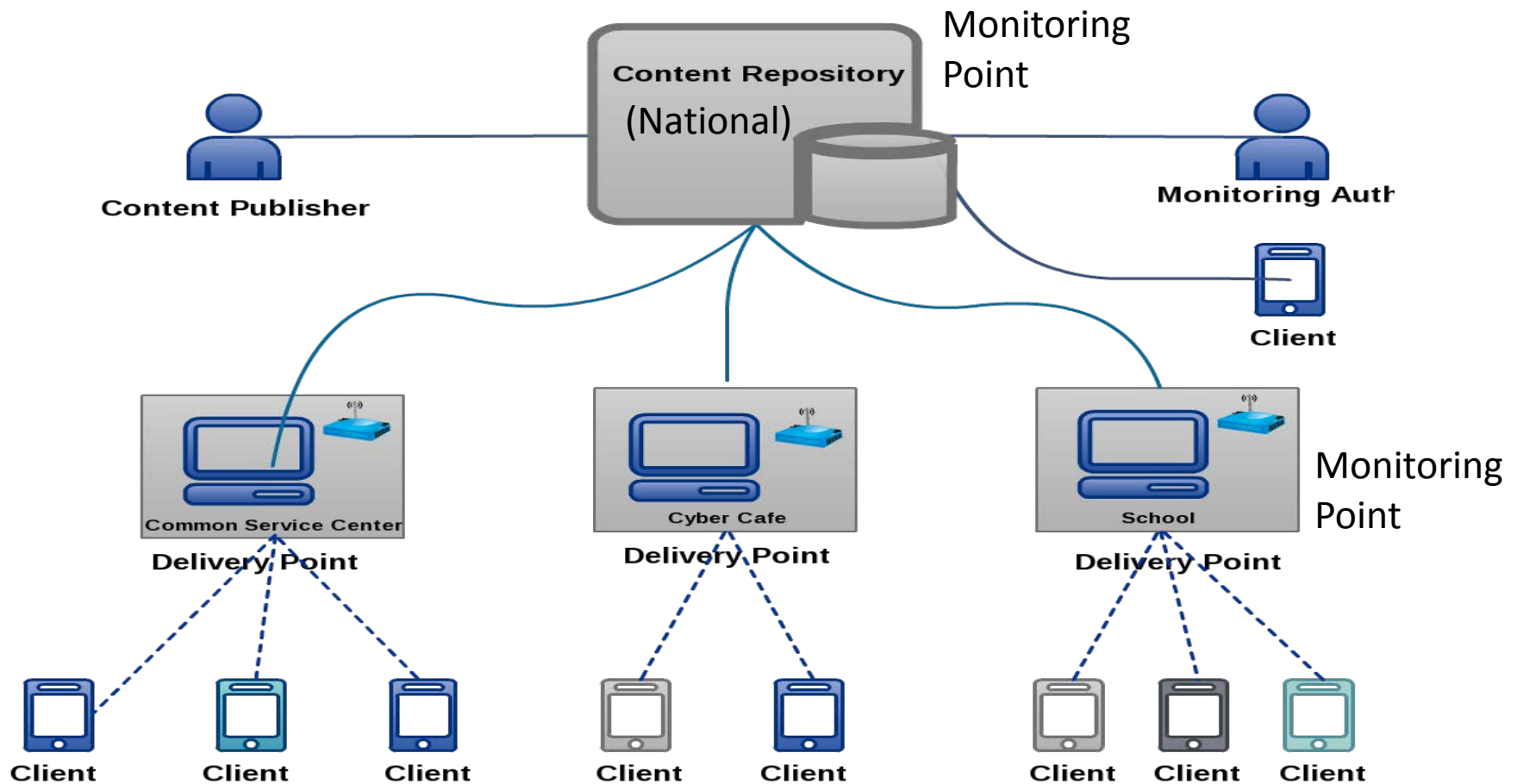


Each client has {Client App Ecosystem, Monitoring Point, Content}

# Client-App Ecosystem



# Conceptual Model



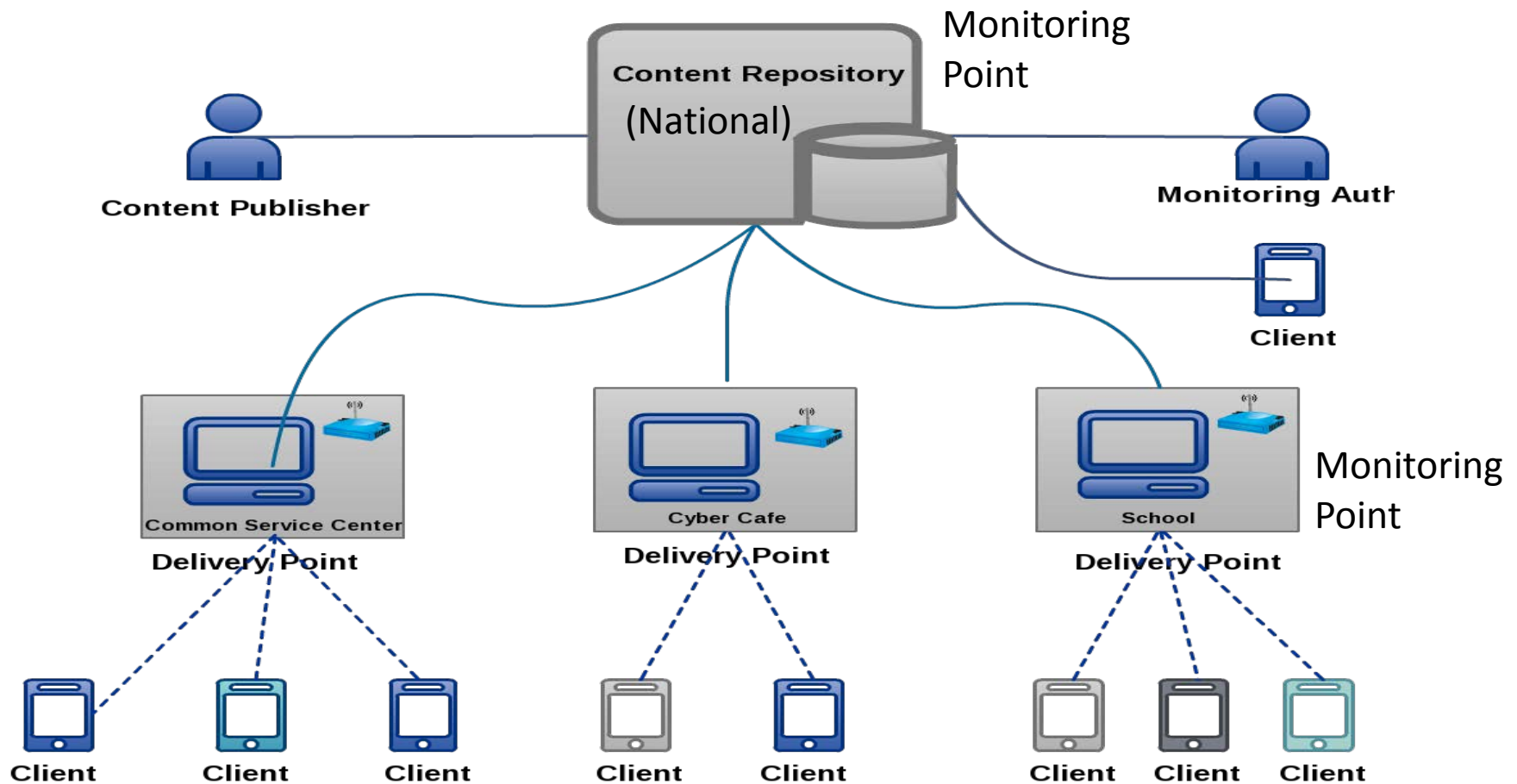
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# Network Connections

- Content Repository and Delivery Point connected by a network which can be intermittent
- Delivery Point and Student Tablet connected through a local *Wifi*

# Conceptual Model

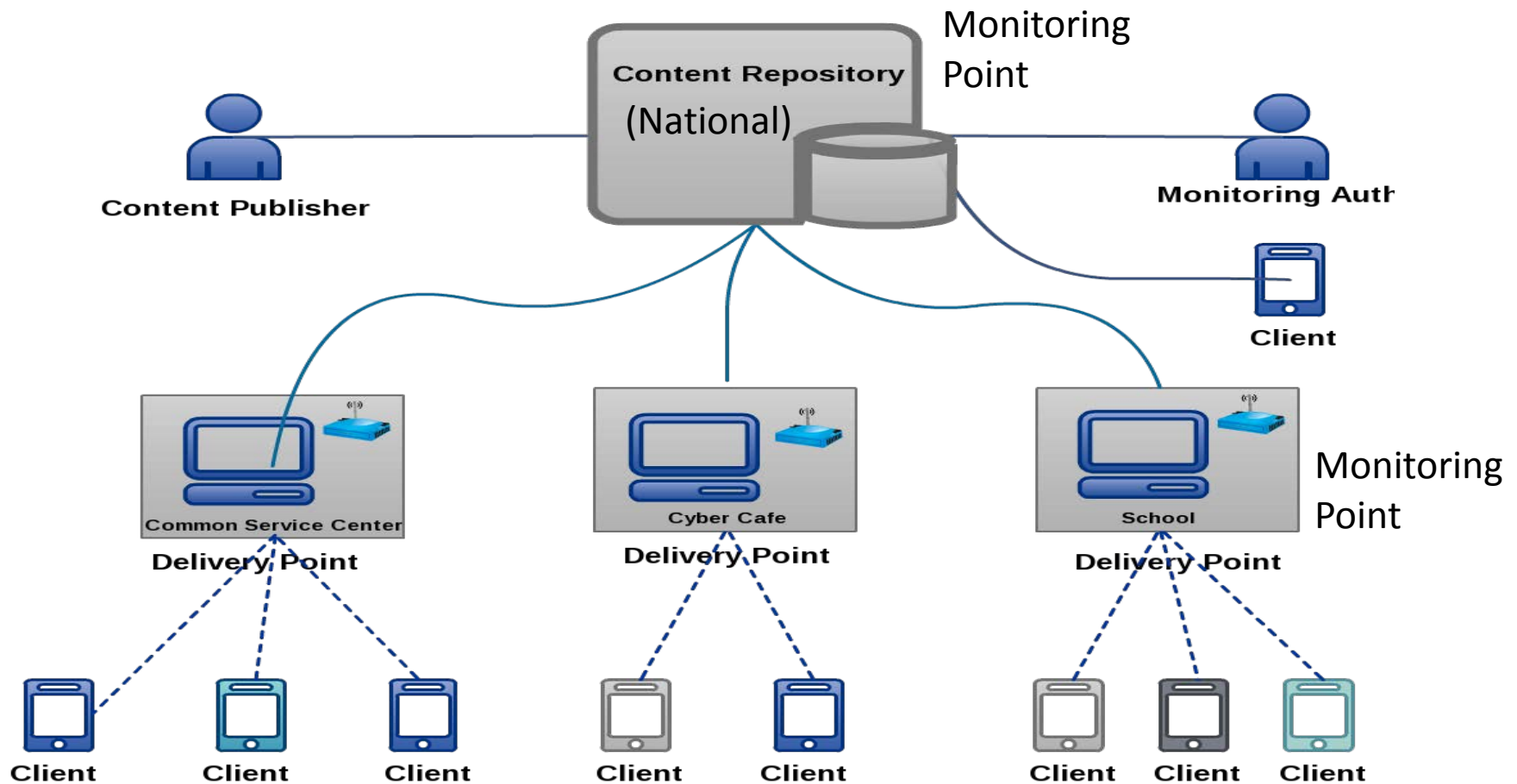


Each client has {Client App Ecosystem, Monitoring Point, Content}

# Content Repository: Responsibilities

- Managing and Hosting Content
- Delivering Content to Delivery Point
- Managing and Hosting Analytics

# Conceptual Model



Each client has {Client App Ecosystem, Monitoring Point, Content}

# Delivery Point Responsibilities

- Deliver Content to Clients
- Handle Channel subscription request from Clients.

# Monitoring Point: Responsibilities

- Collect Usage data(for Analytics) from Clients
- Aggregation of usage data and generating reports for Monitoring Authorities

# Analytics

- At the mobile level
  - Content usage
- At the school level
  - Attendance, content usage, Learning issues
- At the Repository(nation/state) level
  - Content design

# Analytics

Problem - Huge data can be generated, there needs to be control on amount of data gathered

Solution - Aggregation at every level of data upload



# *Madhyam* is about

- Tolerance to intermittent connectivity
- Mechanisms to control the flow of content in the system
- Mechanisms to analyze the usage of system
- Simulations showed that the processing power and storage capacity of inexpensive commodity hardware can easily run the proposed system.

# Future Work

- Similar systems in other verticals like healthcare, agriculture and other government services can also be explored
- Low cost Battery powered devices can be explored for creating Delivery Points – see COL work
- P2P content download can be explored to make system more scalable

# THANK YOU



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