

A Novel Approach for Broadcasting 208 Local TV Channels for the Parliamentary Election



Dr. Mohieddin Moradi

IRIB. Research & Develop Department

An Introduction to Iran and IRIB

17th Largest Country in the World

- Iran, covering an area of **1.64 million square kilometers**
- Iran home to proximately **90 million people**
- Iran ranks as the 17th largest country in the world by both area and population

31 Provinces and 31 provincial TV channels

- The country is divided into **31 provinces each one with one TV channel.**

The Islamic Republic of Iran Broadcasting Organization (IRIB)

- The IRIB serves as the sole broadcaster utilizing **the Digital Terrestrial Television (DTT) system.**

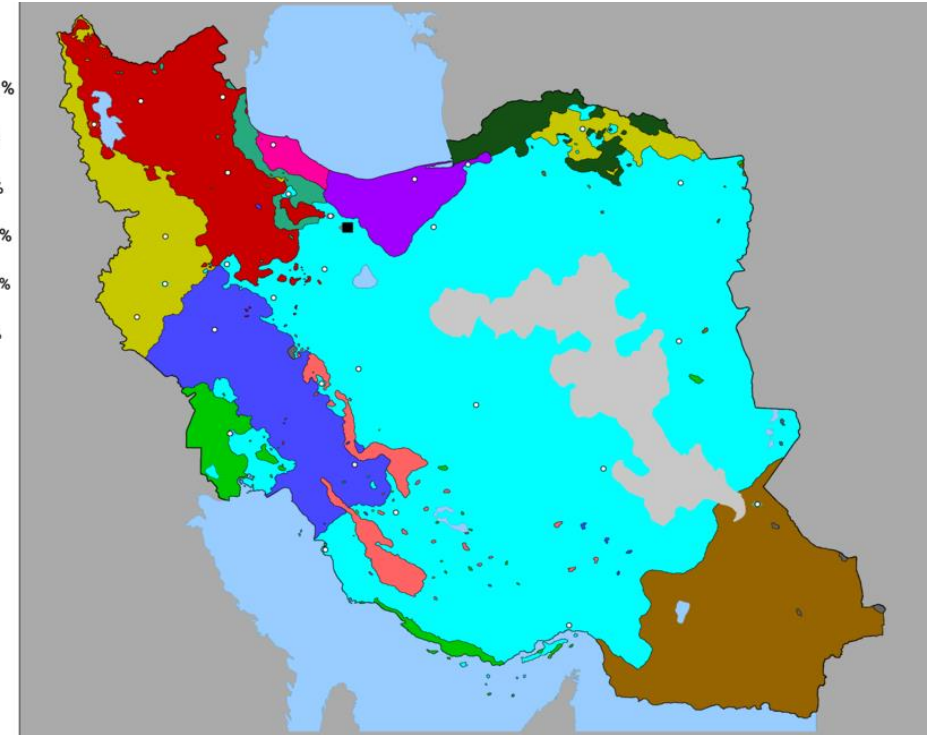
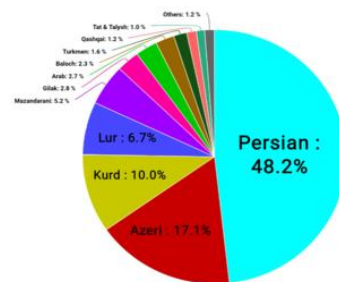
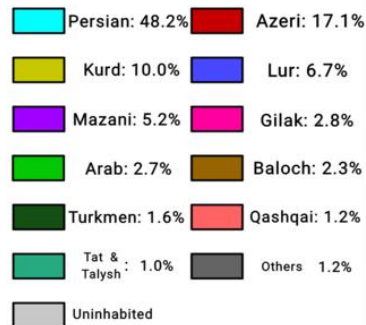


An Introduction to Iran and IRIB

31 Provinces and provincial TV channels besides 18 national TV channels.

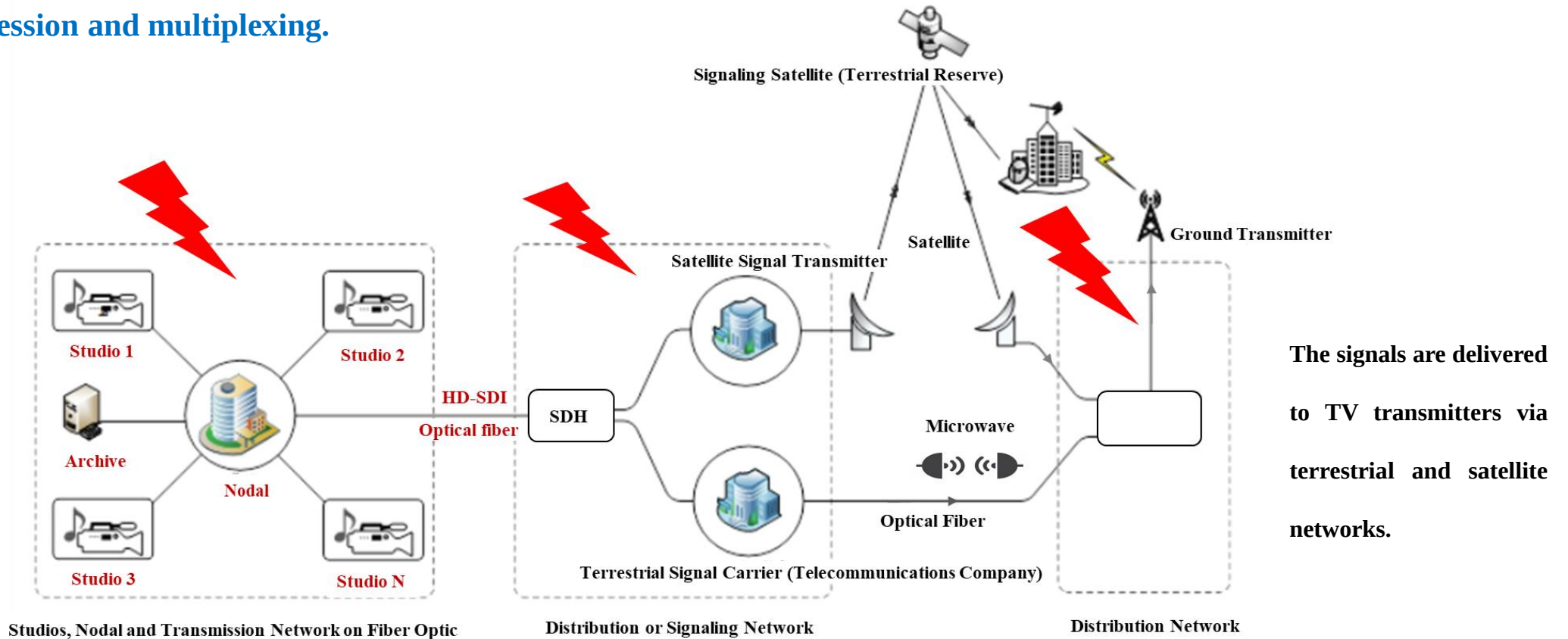
- To deliver **localized content tailored to specific regions** provincial TV channels are established **to cater the local and ethnic content for each province.**
- The provincial TV channels are used to **showcase the culture, customs, news, events, and local programming** relevant to the residents of each province.

Ethnicities in Iran



IRIB Broadcast Chain for National and Provincial TV Channels

- After television content is produced, high-quality video is transferred to the **IRIB broadcast center or Nodal**.
- The content is then sent to the **distribution network**, which includes terrestrial and satellite Head-Ends **for video compression and multiplexing**.



The IRIB Multiplexes for DTT Broadcasting

- A multiplex enables **the transmission of multiple television channels simultaneously over a single frequency.**
- **18 national television programs** are broadcast in SD format via multiplexes 1 and 2. (DVB-T/AVC)
- Among these 18 programs, **14 are concurrently broadcast in HD format through multiplexes 3 and 4.** (DVB-T2/HEVC)
- Additionally, **provincial TV channels** are integrated into the second multiplex within each province.
 - ✓ Provincial TV channels are integrated into the available capacity of IRIB multiplex **2 with a fixed bitrate in each province.**

IRIB Multiplexes	Transmission and Compression Standards	Number of Assigned TV Channels and Video Format
Multiplex 1	DVB-T, AVC, SDTV	9×SD TV Channels
Multiplex 2	DVB-T, AVC, SDTV	9×SD TV Channels + 1×Provincial SD TV Channel
Multiplex 3	DVB-T2, HEVC, HDTV	8×HD TV Channels (Simulcasting)
Multiplex 4	DVB-T2, HEVC,HDTV	6×HD TV Channels (Simulcasting)

The IRIB Multiplexes for DTT Broadcasting

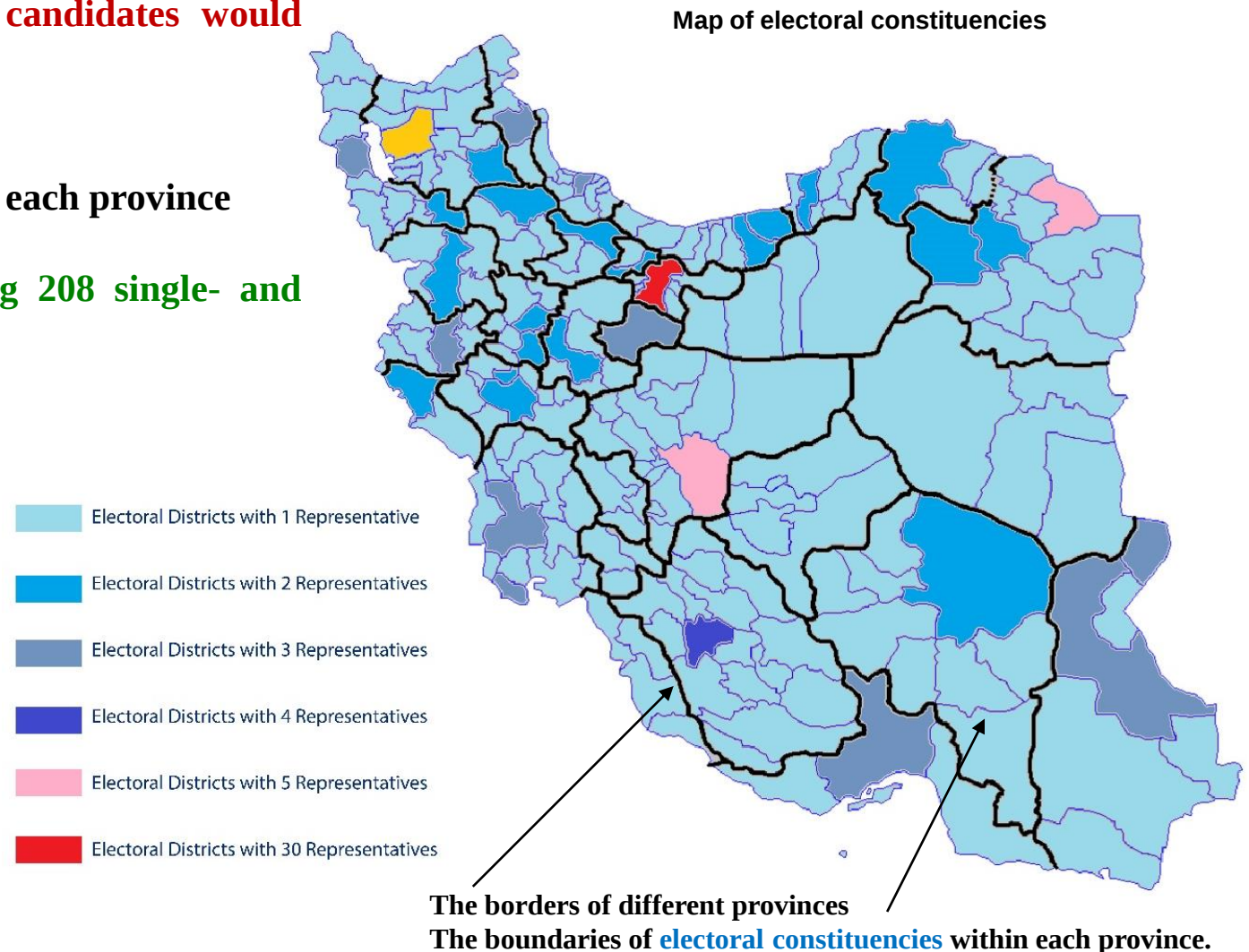
- **There is insufficient capacity of provincial TV channels** in specific situations where TV channel provision is necessary across different regions of each province. ➡ The solution is establishing local TV channels with limited and regional coverage
- Example:
 - ✓ **Parliamentary election** that held **every four years**, featuring **thousands of candidates competing across various cities**.

IRIB Multiplexes	Transmission and Compression Standards	Number of Assigned TV Channels and Video Format
Multiplex 1	DVB-T, AVC, SDTV	9×SD TV Channels
Multiplex 2	DVB-T, AVC, SDTV	9×SD TV Channels + 1×Provincial SD TV Channel
Multiplex 3	DVB-T2, HEVC, HDTV	8×HD TV Channels (Simulcasting)
Multiplex 4	DVB-T2, HEVC,HDTV	6×HD TV Channels (Simulcasting)

Parliamentary Election and Insufficient Capacity of Provincial TV Channels

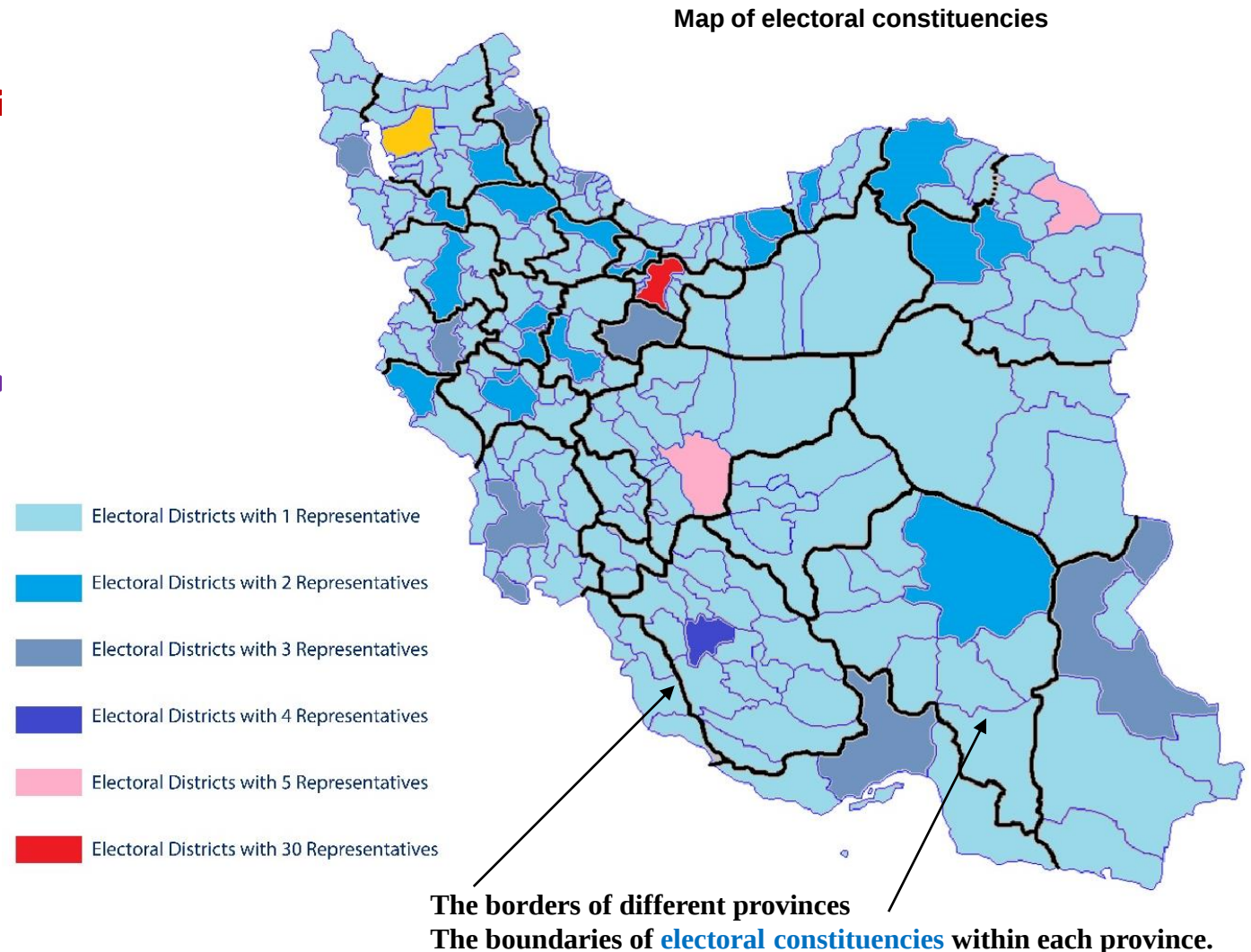
In 2024 parliamentary election about **15,000 candidates would compete** in electoral districts across the country.

- There were several **electoral constituencies** in each province
- **290 directly elected seats** distributed **among 208 single- and multi-member constituencies.**



Parliamentary Election and Insufficient Capacity of Provincial TV Channels

- Key challenge in parliamentary election was:
 - ✓ Ensuring **equal opportunities for candidates** to express their views and programs.
- To address this limitation, it was necessary to establish a **local election TV channel for each electoral constituency**.
- Our novel approach was:
 - ✓ To leverage **terrestrial broadcasting** throughout the nation capacity to introduce candidates' backgrounds, viewpoints, programs, and objectives.



The Number of Election Local TV Channels in Each of the 31 Provinces

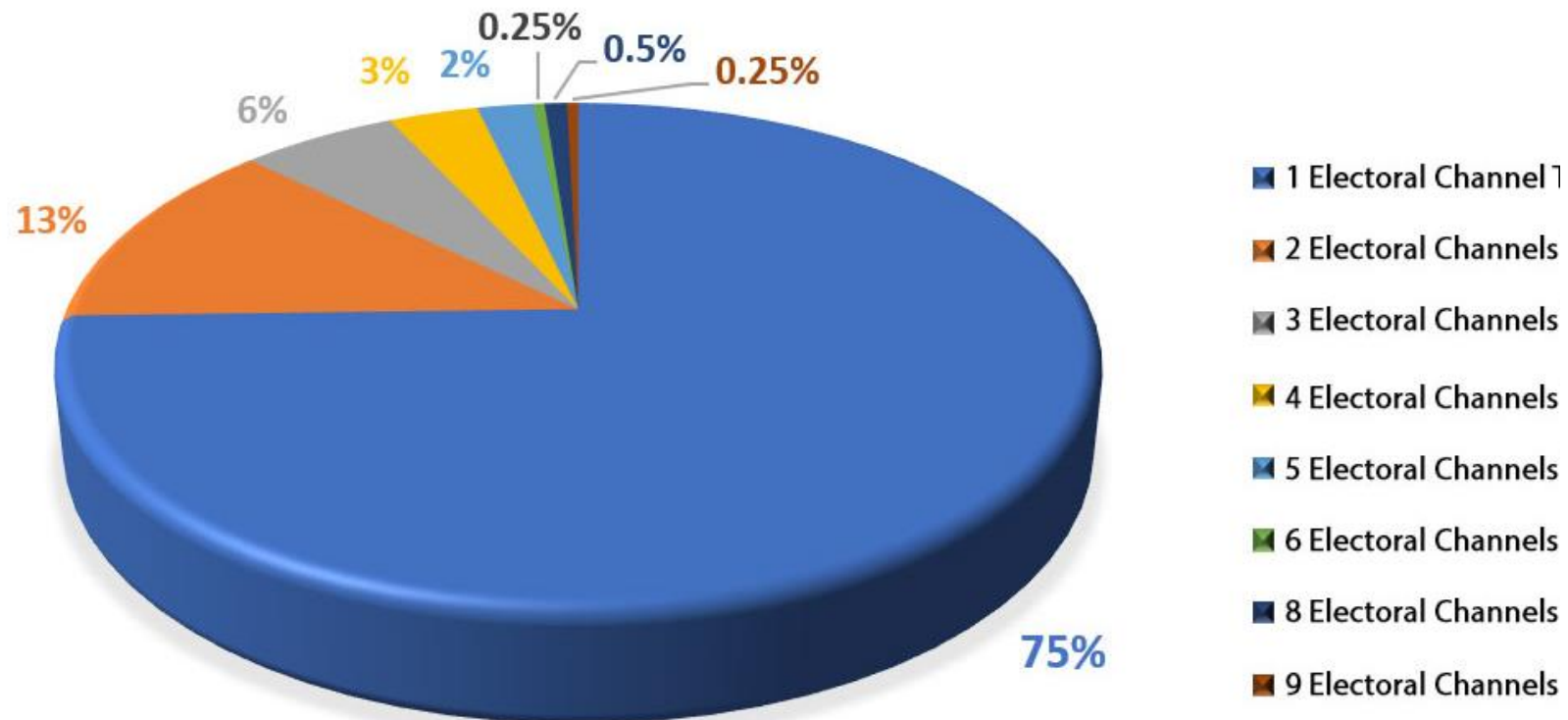
- The number of election local TV channels in each of the 31 provinces of the country is shown in figure.
 - ✓ Many provinces host multiple election TV channels, with some having **up to 16 channels**.



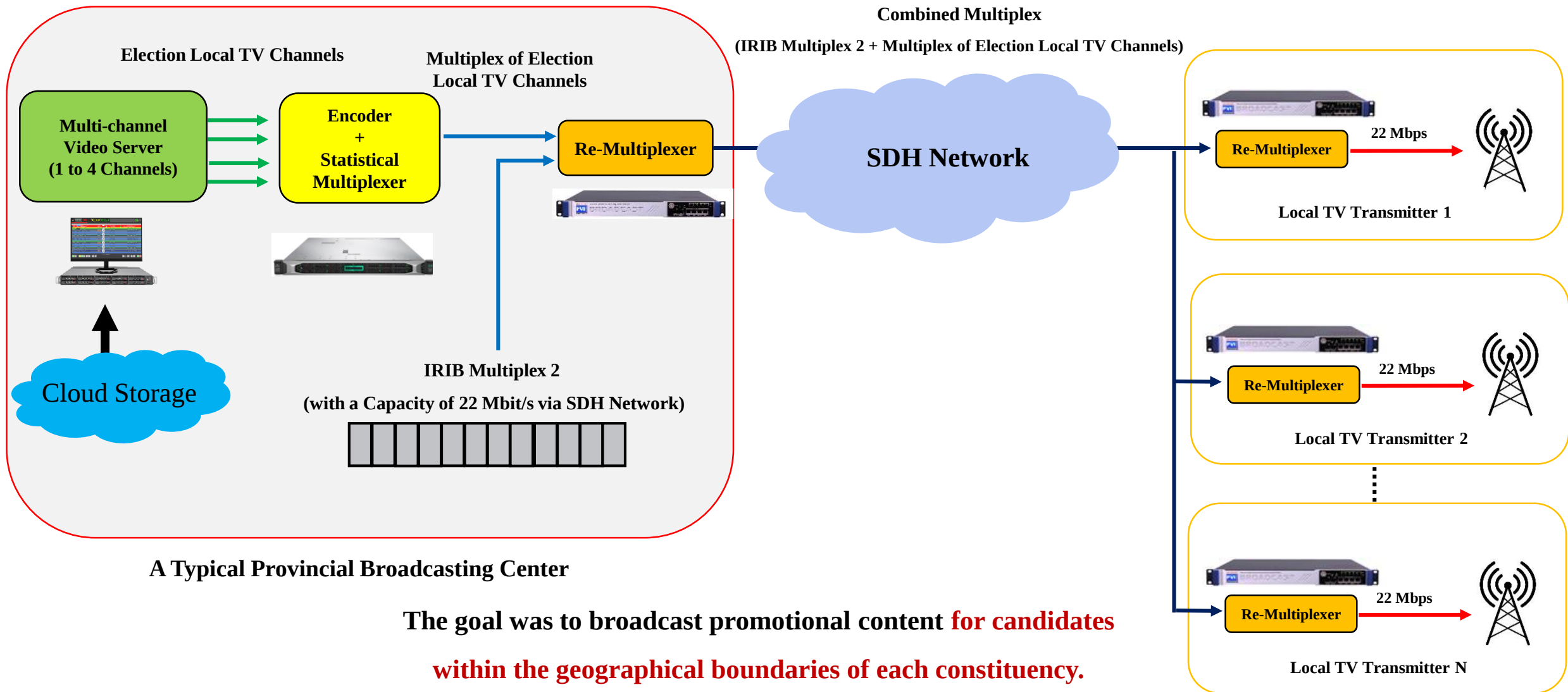
The number of election local TV channels in each of the 31 provinces

The Number of Election Local TV Channels in each Transmitter

- Figure illustrates the percentage of TV transmitter stations **broadcasting 1 to 9 election local TV channels**.
 - ✓ Approximately 75% of the television transmitters had one election TV channel, while 25% had between 2 and 9 election local TV channels, highlighting the complexity of the project.

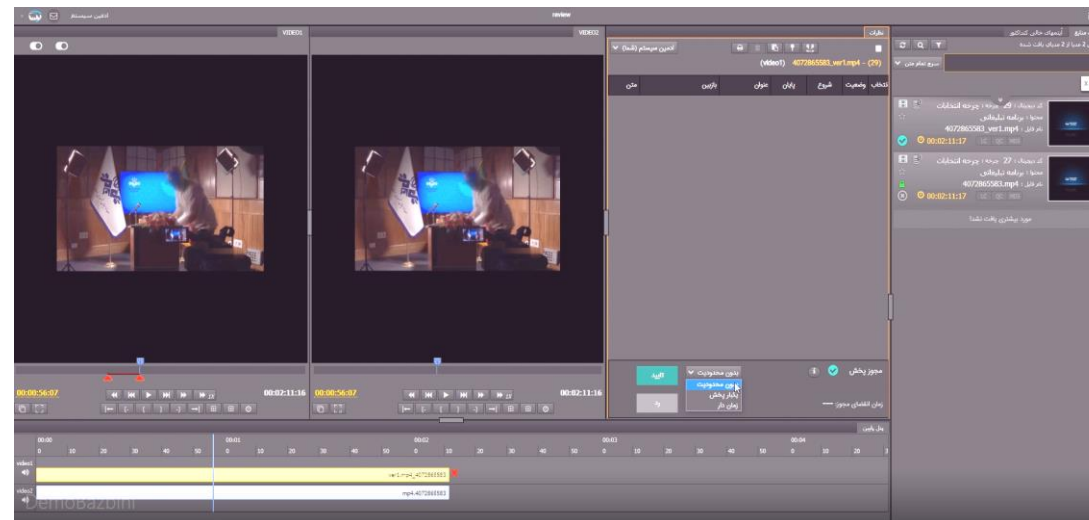


The Overall Block Diagram of Launching 208 Election Local TV Channels



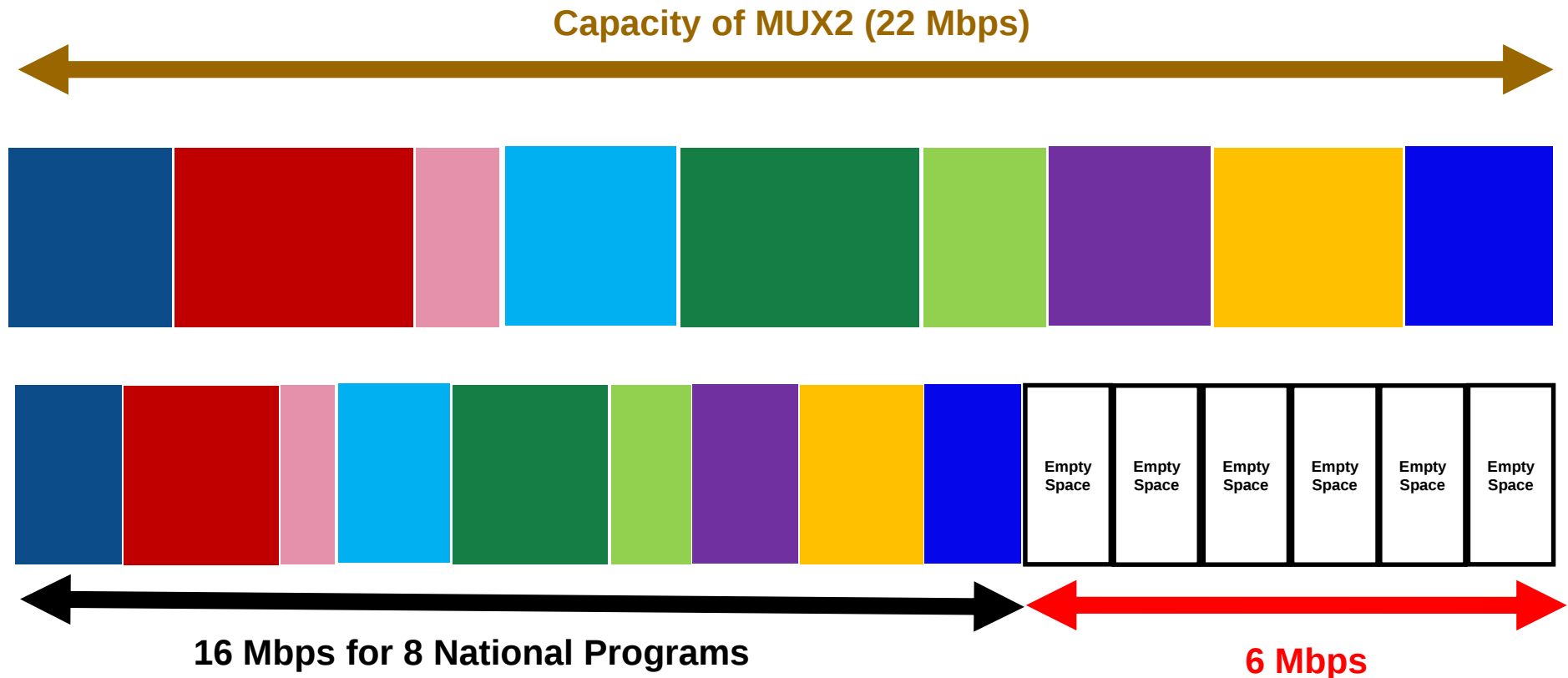
Launching 208 Election Local TV Channels

1. Development of a unified platform for uploading and managing the content of election local TV channels.
 - Multi-channel playout servers are used for the candidates promotional content playback.
 - To address managing candidates promotional content for timely broadcasting according to the set schedule a suitable cloud storage solution was established for uploading promotional content.
 - The content was then reviewed and approved by broadcast reviewers.



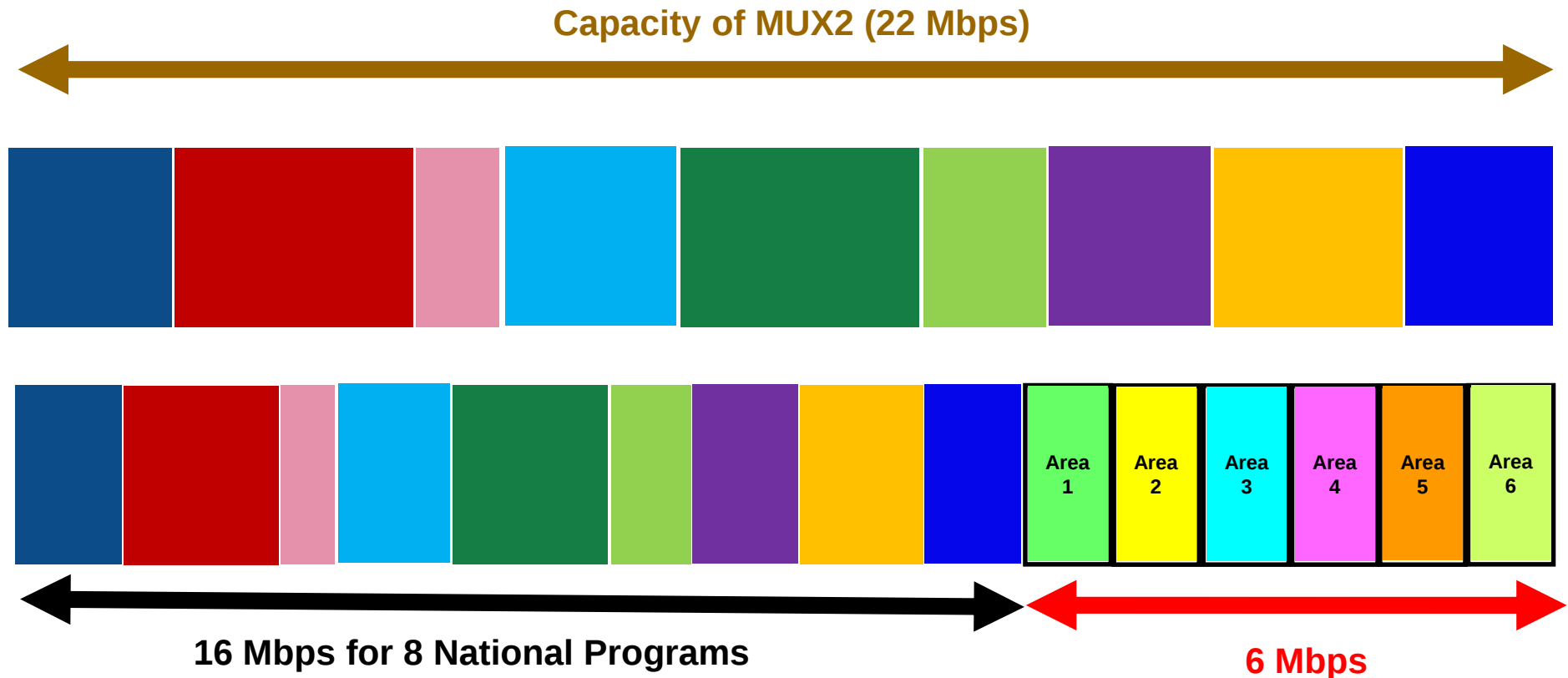
Launching 208 Election Local TV Channels

2. Provision of the necessary capacity for broadcasting election local TV channels within IRIB multiplex 2.
 - IRIB multiplex 2 was selected to host the election local TV channels since the provincial TV channels are already included in this multiplex.



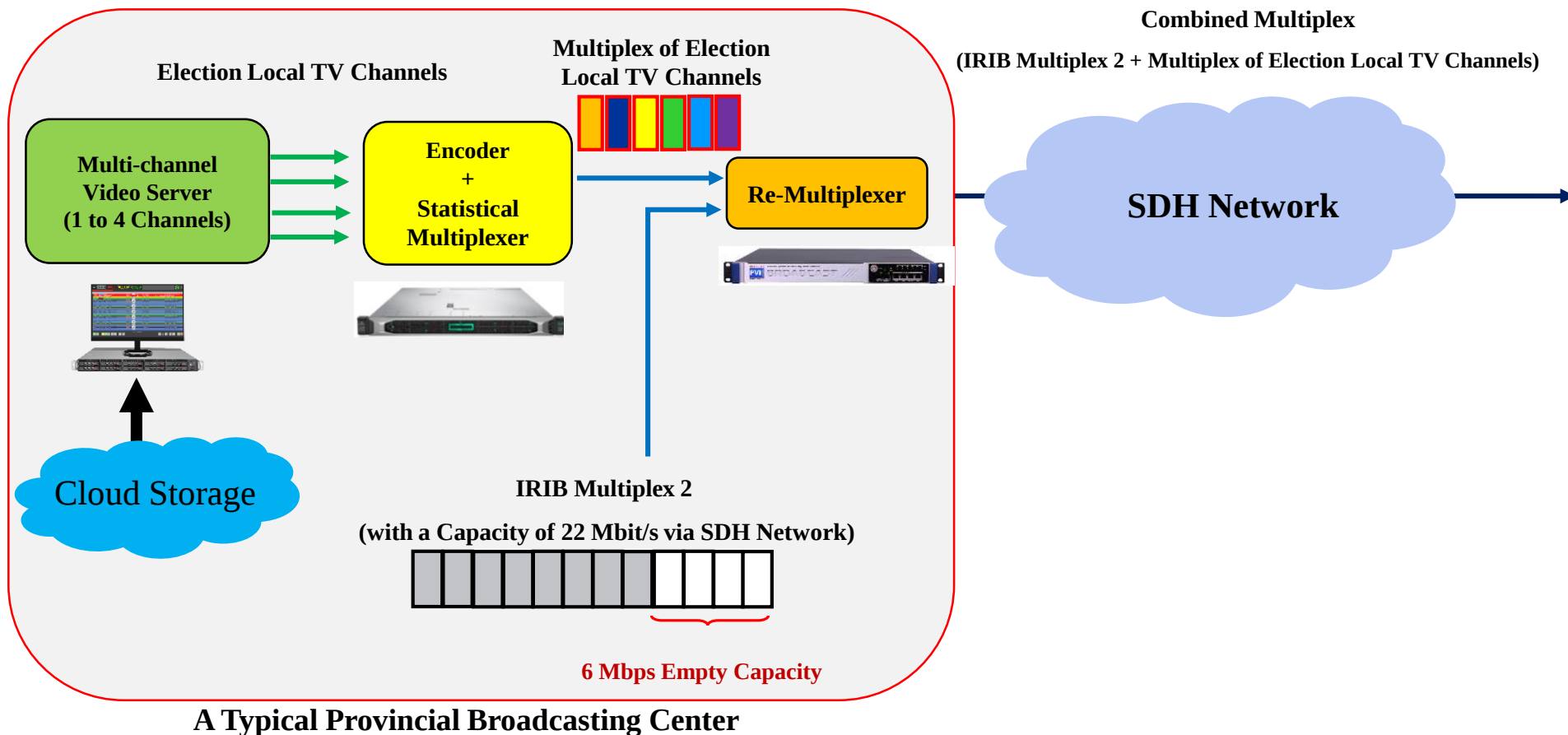
Launching 208 Election Local TV Channels

2. Provision of the necessary capacity for broadcasting election local TV channels within IRIB multiplex 2.
 - IRIB multiplex 2 was selected to host the election local TV channels since the provincial TV channels are already included in this multiplex.



Launching 208 Election Local TV Channels

3. Creation of a dedicated multiplex of election local TV channels in each province and its combination with IRIB multiplex 2 to form a combined multiplex.

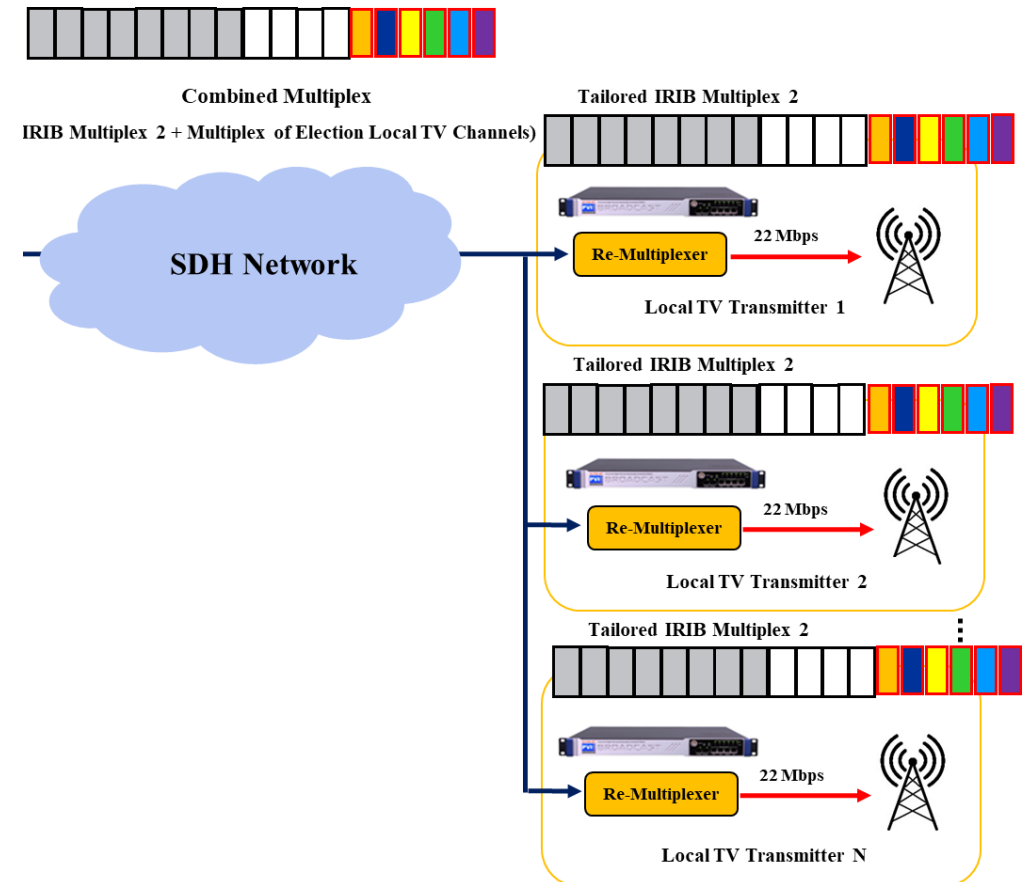


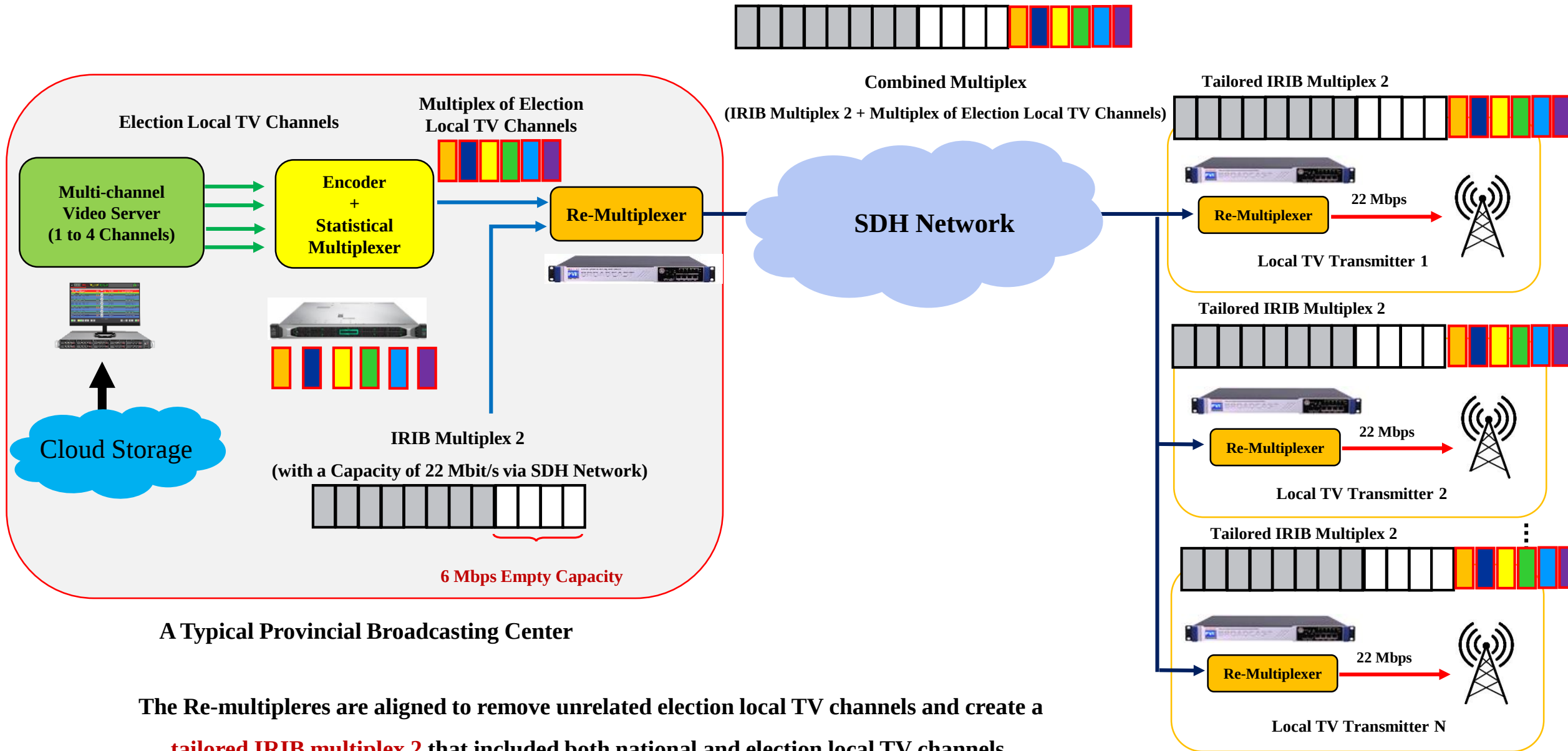
Launching 208 Election Local TV Channels

4. Removal of unrelated election local TV channels and formation of a **tailored IRIB multiplex 2** in each TV transmitter station for broadcasting.

- The combined multiplex was transmitted to the TV transmitter stations within each province via the terrestrial distribution network.

✓ Only 250 TV transmitter stations are used to reach about 90% of the population coverage





The Re-multiplexers are aligned to remove unrelated election local TV channels and create a **tailored IRIB multiplex 2** that included both national and election local TV channels.

Key Features of Broadcasting the Election Local TV Channels

Enhanced connectivity:

- Established a coherent connection between broadcast and broadband platforms to better introduce candidates for parliamentary representation to voters.

Efficient use of multiplex capacity:

- Utilized existing TV multiplex capacity to broadcast election local TV channels without interrupting or altering other national and provincial services.

Utilization of existing infrastructure:

- Leveraged current terrestrial digital TV transmitters, avoiding the need for new digital transmitters.

Project execution within constraints:

- Successfully delivered election local TV channel content to transmitter stations while respecting the limitations of the existing terrestrial distribution network.

Cost-effective solution:

- Optimized the widely available DTT platform without imposing additional costs on either broadcasters or audiences.