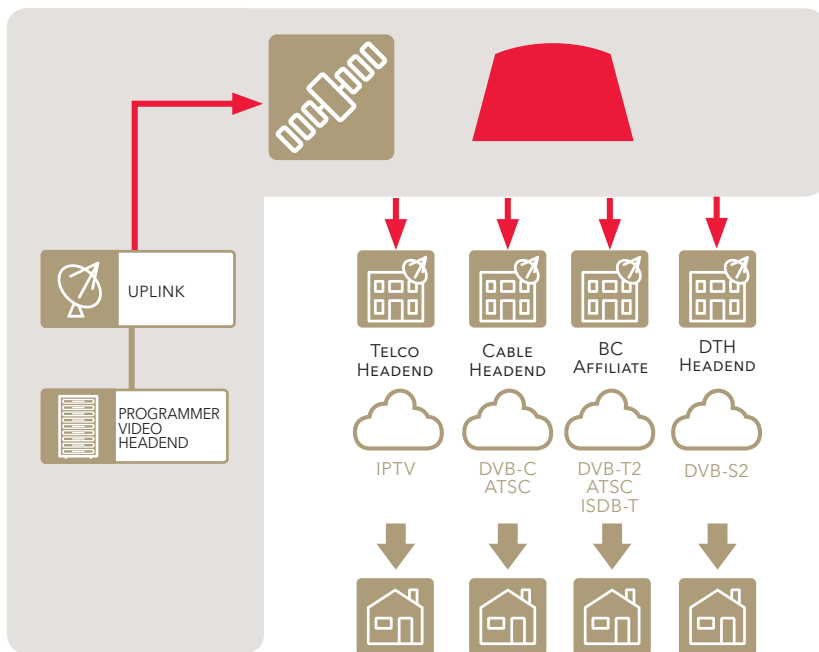


INTERACTIVE PRIMARY DISTRIBUTION

Introduction

Billions of people are watching valuable TV content and advertising on a daily basis. Different distribution networks transport this content from the content owner to the consumer. The consumer has the choice to receive a full set of TV channels from many service providers, be it telco, cable, terrestrial or DTH operators.

A reliable primary distribution network is crucial. Any service loss instantly impacts millions of consumers.



DIALOG

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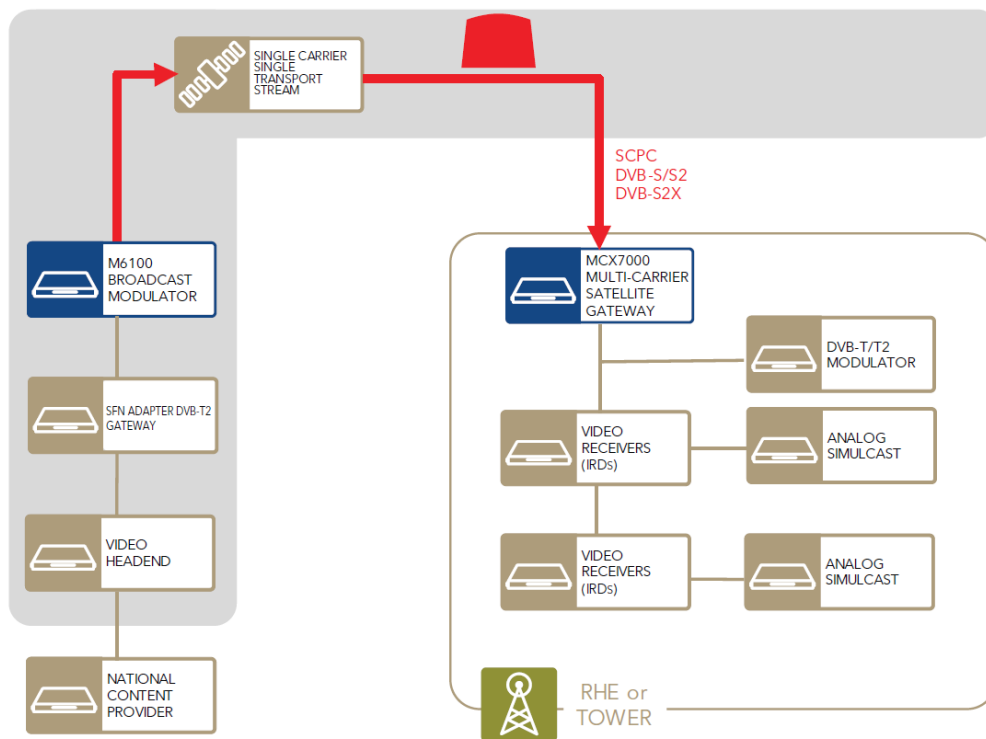
Newtec 

Primary Distribution to Headends...

One important step in the content distribution network is the primary distribution of TV channels from the content provider's video headend and uplink (programmer video headend), to the headends of each of the service providers. In many cases, TV channels are distributed to 100s or 1,000s of headends. Naturally, satellite is the preferred medium used for primary distribution. Dispersed over vast geographical areas, these headends retransmit the received TV channels to many millions of consumers paying to watch the content. Therefore, any service loss in the primary distribution network instantly impacts millions of consumers, resulting in consumer churn and instant loss of advertisement revenues for service providers and content producers.

...and Towers

The same is true for primary distribution to DTT Towers. Content aggregated by the service providers needs to be distributed to many towers dispersed over a large geographical area for off-air retransmission.



Advanced Technologies: The Quest for Efficiency

While reliability, flexibility and deploying future proof solutions are key considerations for primary distribution operations, a significant amount of effort is spent on ever more efficient transmission, in order to minimize cost. This is the reason why many networks have been upgraded from DVB-S to DVB-S2 or even DVB-S2X.

In addition, other advanced technologies are available to improve transmission efficiency. These technologies include:

- Clean Channel Technology®: Low roll-offs combined with advanced filtering techniques
- Equalink® 3: The latest advancement in linear and non-linear pre-distortion for single carrier per transponder operations

- Multistream: Allows operators to aggregate a number of independent transport streams or IP streams into one carrier in a fully transparent manner, maintaining the integrity of the original content
- Wideband: Provides aggregated streams to be up to 72 Mbaud, resulting in one large single carrier to be transmitted over satellite. This allows the operator to saturate the transponder, thereby increasing the efficiency by up to 20% through non-linear operation

The efficiency improvements these technologies provide can also be stacked.



Interactive Primary Distribution

In order to meet Service Level Agreements, primary distribution operators become more and more interested in monitoring the capabilities of the remote locations in addition to being able to control them.

Reporting capabilities of revenue generating events is very important, such as actual broadcasting reports of advertisement insertions or even full broadcast confidence monitoring per region.

For DTT deployments, transmission towers are often set up at locations which are not only far away, but also hard to reach due to altitude or weather conditions. Being able to monitor and control the complete tower site remotely – including its environment – may generate significant OPEX savings.

Measurable data from peripheral equipment such as diesel tank fuel level indicators, tower environmental data, local weather conditions and site security monitoring including CCTV can all be collated centrally.

The OPEX savings are realized as preventive measures can be taken proactively, minimizing the need to dispatch technically highly skilled people on site. In case a local intervention is required, VoIP communication may help speedy troubleshooting.

Until today, such an infrastructure has been too expensive or operationally difficult using terrestrial (VPN) links. The satellite based solution Newtec offers lowers the barrier to entry on both CAPEX and OPEX sides.

The Bidirectional Satellite Link

With a bidirectional satellite IP-link, monitoring and control of all transmission equipment, reconfiguration of channel line-up and RF parameter measurement of actual transmissions all become possible.

Confidence monitoring, where transmitted content is demodulated and radio or low resolution video is sent back to the NOC can also be facilitated.

Cost-effective bi-directional monitoring & control over satellite saves OPEX:

- Preventive measures can be taken
- Minimize dispatch of technically highly skilled personnel to far away towers in harsh environmental conditions
- Reduce space segment usage by sharing the distribution carrier with the VSAT forward

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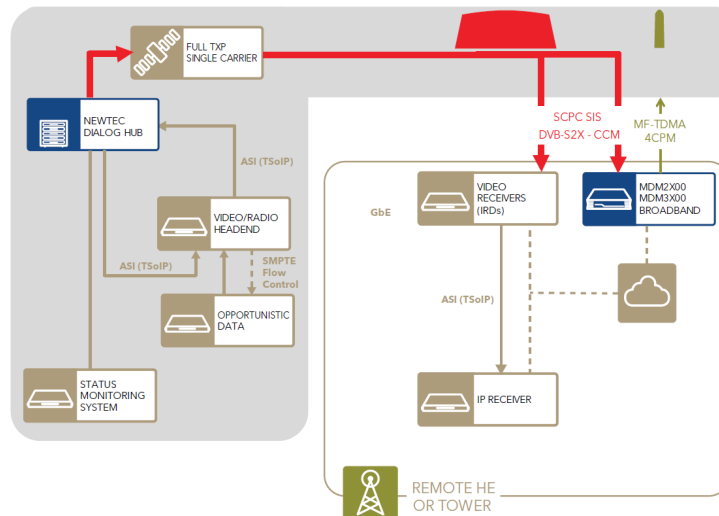
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Newtec Dialog®

The Newtec Dialog® platform provides the right tools for remote monitoring and management. Low bitrate transmissions such as monitoring and control, and VoIP services are usually based on VSAT MF-TDMA access technology. The platform supports a mix of always-on broadband and VoIP connectivity on a 4CPM MF-TDMA return link between the remote terminals and the central playout, guaranteeing the Quality of Service (QoS) of each of these services through per service QoS settings.

The narrowband link requires a very low amount of satellite capacity consumption, while the cost of the terminal is very affordable starting at just a few hundred dollars!



Interactive File Multicasting and Unicasting

The same Newtec Dialog platform can be used to facilitate file multicasting from the central playout to the headends and file unicasting from the headends back to the central playout. This opens up the classical video live distribution network for new technologies such as video on demand (VoD), ads and video clips. The return channel can be used for backhauling video files from regional headends.

The file exchange module provides the operator with a tool to transfer file based content error-free and is conceived as a software product that can support various use cases typically found within satellite broadcasting. It serves a broad range of point-to-point and point-to-multipoint applications.

The file exchange module is designed for satellite optimized file transmissions, supporting file transmissions over a unidirectional link with guaranteed file delivery through FEC mechanisms and retransmission of lost file fragments.

On top of the 4CPM modulation with MF-TDMA return technology, HRCTM modulation with Mx-DMA™ can also be used.

Mx-DMA is the return technology that incorporates the best features of MF-TDMA and SCPC technologies, solving the difficult choice of selecting one or the other. MF-TDMA is ideally suited to provide broadband access for the monitoring and control of large populations of remote headends or towers.

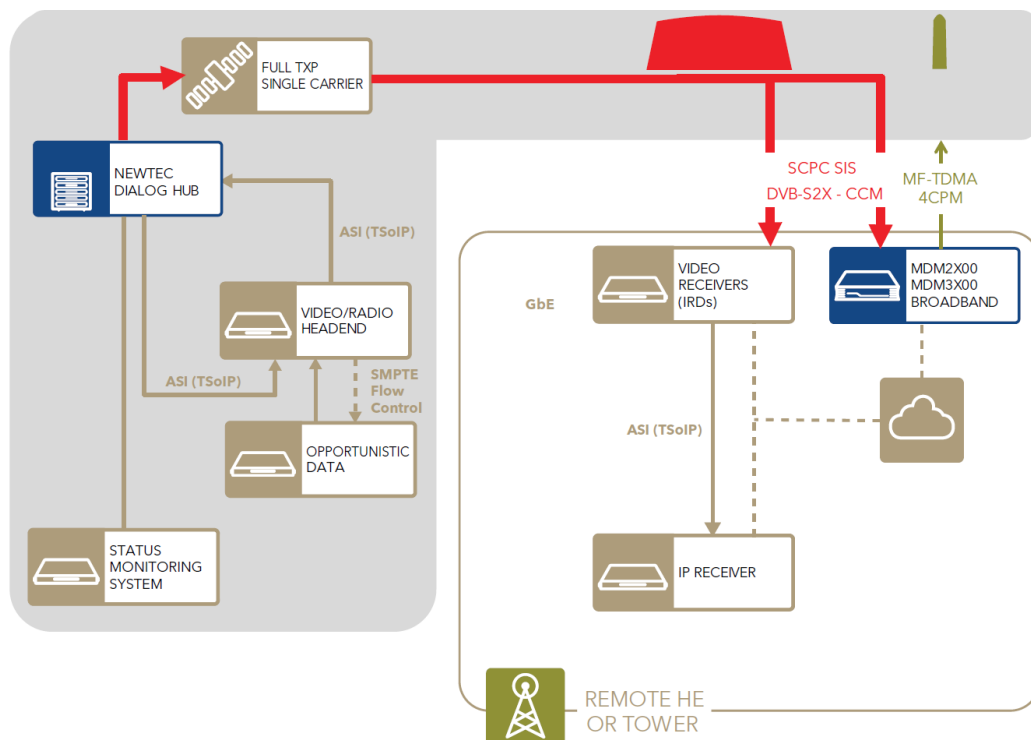
Mx-DMA is ideally suited to provide larger bandwidth from the remote headends towards the broadcast uplink enabling, for example, file transfers.

Improving Efficiency for Interactive Primary Distribution

In order to minimize the space segment usage needed to launch “Interactive Primary Distribution”, the Newtec Dialog DVB-S2 (soon to be DVB-S2X) forward carrier can be shared with another system.

The characteristics of this shared carrier can be set to a single Transport Stream (TS) using Constant Coding and Modulation (CCM). This enables the reception of this shared carrier by a wide range of legacy devices such as IP receivers, DTH STB, etc., that typically are not capable of receiving Multistream or Adaptive Coding and Modulation (ACM) carriers.

The actual sharing is done by multiplexing a TV or radio transport stream (TS) with the Multi-Protocol Encapsulation (MPE) encapsulated IP data from the Newtec Dialog system using an external MUX. The Newtec Dialog platform interfaces with the external MUX using ASI interfaces. The external MUX adds the audio/video broadcast transport stream and sends the multiplexed stream back to the Newtec Dialog forward modulator. The modulator then sends the multiplexed stream over satellite to remote Newtec Dialog terminals and other reception only devices. The setup can be configured fully redundant, guaranteeing high availability of the audio/video service.



Services and Applications

- Primary distribution to headends
- DTT distribution: DVB-T/T2, ISDB-T, ATSC
- Radio Distribution
- MFN & SFN Networks
- 6-8 DVB-T2 Mux per Xponder
- DTH Overlay Possible
- SD & HD Services, UHD ready
- Encrypted or FTA content
- Always-on IP Connectivity
- Remote monitoring & control via secure connection
- Opportunistic Data Insertion

Cost-effective bidirectional monitoring over satellite creates visibility to the content owner of the local processing and ad insertion in all remote locations or a subset thereof (e.g. one per digital market).

Benefits of ST Engineering iDirect's Technologies for Broadcast Interactive Primary Distribution

Scalability

- Turn a traditional distribution network into a more efficient interactive distribution network while preserving installed base of infrastructure
- Re-use existing IRDs in all growth scenarios, including NMS and encryption: no operational changes
- Add file distribution and exchange to traditional live distribution

Flexibility

- Breadth of choice for satellite RF interfaces as well as audio/video interfaces
- Agnostic to video compression technology (MPEG-2, H.264, HEVC)
- Agnostic to video format (SD, HD, Ultra HD ready)
- Supports video, audio and data distribution and exchange
- Integrated with all leading manufacturers of video headends and distribution systems (Cisco, Arris, Harmonic, Ericsson, etc..)

Efficiency

- Use highest modulation efficiency including SW upgrade to DVB-S2X
- Clean Channel Technology works with a lot of professional receivers up to 10% roll-off
- Full transponder saturation with DVB multistream
- Efficient transponder utilization using linear and non-linear Equalink 3
- High performing and patented demodulator: better link margin and RFI resilience compared to silicon based IRDs
- Fast troubleshooting of video headend using real-time transport stream analyzer in all modulators