Network Overview

Broadband Internet and Cable TV access

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Overview

- Services
- Hybrid Fibre-Coax (HFC) Network Description
- High-Speed Data Platform Description
- Headend and Network Components
Hybrid Fibre-Coax (HFC) Network Services

Services delivered via this network are:

- Broadcast TV Services
  - Digital and Analogue Cable TV Service Platforms
  - Pay-Per View Content Management and Scheduling

- Broadband Internet Services
  - On-net Cable Modem Internet Access
  - Digital Cable TV return path traffic is also delivered via a dedicated Cable Modem connection.
Cable Television (CATV) Network Description

- High-capacity access infrastructure delivered to customers in Wellington and Christchurch over Hybrid Fibre-Coaxial (HFC) Cable Network Technology
- Provides Analogue and Digital Cable Television (CATV) Services and High-Speed Internet via Cable Modem
- Pay-Per-View Services are maintained and managed on nCUBE Video Server Technology
  - TelstraClear customers via Saturn Cable TV – Analogue and Digital
  - Delivered to Sky TV customers via the Satellite Uplink Network
CATV System Overview

Wellington
- Off-air Content Video
- Analogue CATV
- Digital CATV
- Decoding and Playout
- MPEG Encoding/Mux
- Scrambling/Modulation
- Satellite Uplink
- Video Server
- MPEG Encod/Mux
- Analogue CATV
- Digital CATV
- Remux
- Scrambling/Modulation
- Analogue CATV
- Digital CATV
- Customer
- CPE Required to provide both Cable TV (Analogue/Digital) and High-Speed Internet

Christchurch
- Video Server
- MPEG Decod
- Analogue CATV
- Digital CATV
- Back Bone linking for delivery of TV Channel Content from Wellington to Christchurch
- Video Servers play Pay-Per View Movies to CATV Customers

Analogue CATV
Digital CATV

Analogue CATV
Digital CATV

Customer

Backbone linking for delivery of TV Channel Content from Wellington to Christchurch

Analogue CATV
Digital CATV

Video Servers play Pay-Per View Movies to CATV Customers
High-Speed Internet

• Delivered via HFC Cable Modem Technology –:
  • DOCSIS
    • Data Over Cable System Interface Spec
    • Mature, standardised and widely available resulting in low-cost CPE and Headend system equipment
High-Speed Cable Internet

High-Speed Internet Block Diagram
The ‘Headend’

- The Headend is the Cable TV system’s ‘brain’
  - The point of origination for television programming and data traffic delivered to and from cable modems
  - Each source requires special processing before it can become part of the combined broadband CATV signal
  - There are a variety of devices at the Headend to process, combine and manage these signals for cable transmission

- Separate Headends exist in Wellington and Christchurch
  - Kapiti is served via the Wellington Headend for all TV and High-Speed Internet services
  - Most TV Channels are transported in Digital (MPEG) format from Wellington to Christchurch - High-Speed Internet, Pay Per View and some local TV channels are added locally
Signal Combining

- Performed at the Wellington and Christchurch Headends before delivery onto HFC networks
- Achieved through merging groups of individual services into a composite broadband RF signal for transmission.
  - High-Speed Internet
  - Digital TV
  - Analogue TV
- This signal is then converted into a light source and transmitted via a fibre optic cable to Optical Termination Nodes (OTN) in the HFC Networks
Hybrid Fibre Coax (HFC) Access Network

- HFC CATV network consists of a forward path of 77 to 750MHz and a Return path of 5 to 55MHz.
- Wellington Network started 1996, Christchurch started in 2000
- Downstream information is carried via forward path fibre and split passively to Optical Termination Nodes (OTN)
HFC Network Components

Headend

Universal Enclosure (Wgtn only)

OTN
  Power Supply
  Battery backup

Sector Amplifier
  BTD/MB
  Power Supply
  No batt backup

Amplifier
  BTD/MB

Taps, Couplers, Line Extenders etc.

NTE

Set-top box

Cable Modem

Customer’s Premises
Return Path

• The Return Path comprises of an optical link between the OTN and the Headend.
  • In Wellington returns from each OTN are frequency stacked at each Universal Enclosure (UE) and sent back to the Headend to be demodulated and split back into individual Node paths
  • In Christchurch there is a dedicated upstream fibre from each OTN

• Used for Two-way communication
  • Data ‘uploading’ from High-Speed Internet Customers
  • Purchasing of Pay-per View Movies for Cable TV. Digital TV uses the Cable Modem Network for Movie Purchasing and downloading programme guide info