

Technology : Keeping Ortel Ahead

Ortel at a Glance

- Ortel started its last mile broadband operation in the year 1995
- Ortel is a Broadband Access Network Service Provider
- Presently our operation in the six states : Odisha, Chhattisgarh, Andhra Pradesh, Telengana, Madhya Pradesh and West Bengal
- Triple-play of Cable TV, High Speed Internet & Telephony
 - Modular, scalable network
 - built up in Phases, in line with expanding operations & market growth
- Hybrid Fiber Coaxial Networks : Fiber at the Backbone and Coaxial Last Mile
- Agnostic about Technology / Media
 - Technology Standards : DOCSIS 2.0, Metro Ethernet, Ethernet over Co-axial, Wi-Fi & HotSpot
 - Scalable networks : size & services offered
- Ortel first one to acquire ISP Class C License in 1998. Presently operating with Class A ISP Licenses for all India Operation.
- Ortel has DAS licenses issued by MIB



Ortel's Network

No of Headend :

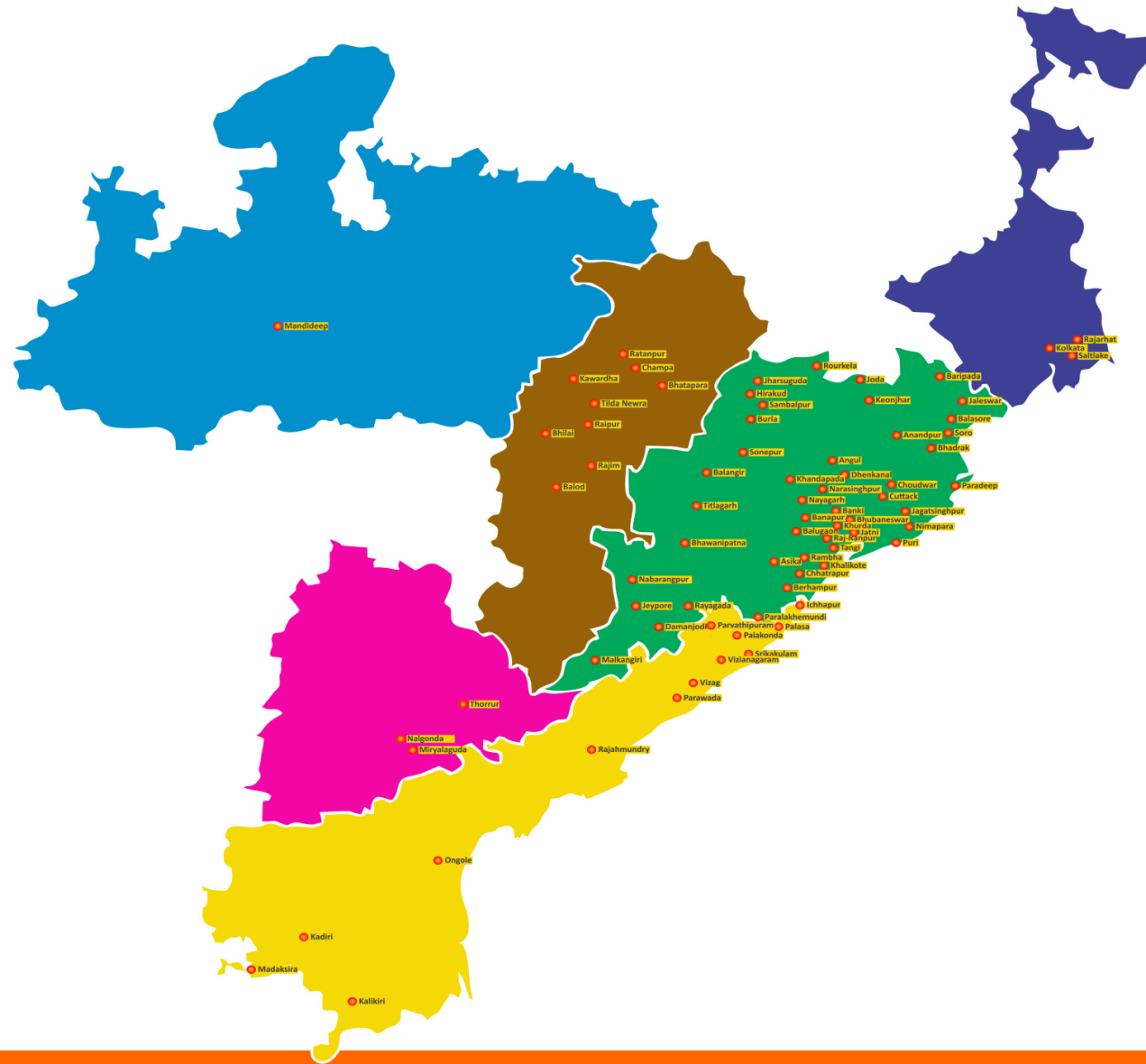
Digital	10
Analog	54
Data	19

Service wise Town / Location:

Interactive	19
Forward Only	41
Digital Locations	43

Cable Used:

<u>Fibre</u>	9568 KM
Coaxial	24721 KM
Drop Coaxial	15641 KM
Grand total	49930 KM



Network Architecture

- A Hybrid Fiber Coaxial (HFC) network, Fiber To The Curb (FTTC) architecture
- Fiber delivers in ring and star topology
- Both Interactive and Forward only networks deployed depending on services offered in any location
- Design based on reverse path, upstream path connected directly from node for Broadband Application
- Bandwidth provisioning planned at NOC by managing Upstream
- 200-300 homes passed per fiber node, no two fiber nodes alike
- 5-40mhz in upstream, 50-862mhz in downstream
- Digital - 256 QAM, Data: DOCSIS 2.0, DOCSIS 3.0, Metro Ethernet(MEN), Ethernet on Coaxial(EoC), Media Convertor
- Use EoC for data in forward only networks.
- SIP for internet telephony & MGCP for CUG using EMTA



Broadband Delivery

- DOCSIS 2.0 and DOCSIS 3.0
- Deployed 19 location with 30 DOCSIS 2.0 carrier grade CMTS and 9 DOCSIS 3.0 Carrier Grade and one Pizza Box.
- 4 location deployed EOC for Broadband and 5 locations deployed MEN
- Upstream in ATDMA & TDMA mode using 16QAM in DOCSIS 2.0
- 4 and 8 Channel Bonding in Downstream and two and four channel bonding in Upstream for DOCSIS 3.0
- Low Dense Data Network with Forward only network: Broadband delivered by EOC
- Pure Broadband Data only Network : MEN Technology Used
- Broadband Delivery using GEPON Technology : Planning stage
- ASTRIX IPPBX used for IP Telephony
- Usage, health & monitoring managed using SNMP module of PERL
- Google Peering



Digital Headend

- Mix of Decentralized & Centralised Digital Headend.
- SMS centralized to all Digital locations
- 70% channel encoded and 30% channels through IRD
- Irdeto & Sumavision CAS in simulcrypt mode
- IP based Digital Headend
- QAM frequency transported through HFC network
- CAS Signal carried on 2Mbps link to remote location for encryption and decryption of signal.
- Middleware with data & games carousel, EPG, NVOD, MOSIAC & Advertisement Server
- QOS comply as per BIS IS-15245 & TRAI regulation
- 256QAM in downstream. 12 CH per freq with 3.5Mbps per Channel
- All CHs processed in IP

Advantages of HFC

- HFC easily be upgraded to FTTH
- HFC Broadband easily superimposed with Wireless for Last Mile
- DOCSIS 3.1 Supersedes all other Technology in Bandwidth
- RF/IP Video Easily Transmitted using Converged Cable Access Platform (CCAP) a varied form of CMTS
- Mobility achieved by using Hotspots
- Hetrodyne of IP and RF for Multiple Services
- Switched Digital Video(SDV) virtually makes HFC equivalent to FTTH

Technologies Being Pursued

- DOCSIS 3.0
 - Can provide Max BW of 344Mbps with 8 Ch Bonding
 - Implemented on the Network Max speed of 100Mbps
 - Using DOCSIS 3.0, Customer get BW 20Mbps, 50Mbps and 100Mbps
 - Again Sharable BW
 - Coexist with RF Network
- Metro Ethernet
 - Committed Information Rate (CIR) due to Point to Point Architecture.
 - Enable Ethernet Application and Services
 - Facilitate implementation of optical Ethernet up to 1Gbps
 - Back bone on optical in Primary and Secondary ring topology and lastmile on Ethernet cable
 - Customer get BW max up to 100Mbps

Technologies Being Pursued

• Middleware Project

- Corpus Media Labs provides intelligent interactive solutions for both SD and HD Set-top Boxes
- Memory Dependant
- Extensive Advertisement.
- Carrousel to be used for interactive services

SL NO	FEATURES	Skyworth STi_5197	Skyworth STi_5197	Chanhong Sti_7167
		Memory Details		
		SD-8/32	SD-8/64	HD-32/256
1	EPG	YES	YES	YES
2	SEARCH & SCAN BANNER.	YES	YES	YES
3	NVOD	YES	YES	YES
4	MOSAIC	YES	YES	YES
5	CHANGABLE GUI	NO	YES	YES
6	VALUE ADDED SERVICE :-			
a	STORY TELLING(E-LEARNING)	YES (Limited as per memory)	YES	YES
b	TV SHOPPING	NO	NO	YES
c	NEWS FEED	YES(Broadcast)	YES(Broadcast)	YES
d	GAME	YES(Resident)	YES(Downloadable)	YES(Downloadable)
e	PUSH-NVOD	NO	NO	YES
f	PICASA	NO	YES(Broadcast)	YES
g	TWITTER	NO	YES(Broadcast)	YES
h	FACEBOOK	NO	YES(Broadcast)	YES
i	YOUTUBE	NO	NO	YES
7	PVR	NO	NO	YES
8	WATER MARK	YES	YES	YES
9	USER DEFINED FAV	NO	YES	YES
10	ADVERTISEMENT(POPUP-IMAGE/BANNER ADD)	YES	YES	YES
11	Internet /SMS PVR	NO	YES	YES
12	NVOD Event Scrambling	YES	YES	YES

Technologies Being Pursued

- High Definition (HD)
 - BW 8Mbps per Channel
 - Presently 11 Channels given on Network
 - Capable of providing Max 18 Channels
 - Resolution 2K (1920 X 1080) with 256M Memory
- HotSpots
 - 19 Hotspots Deployed across 10 important locations of Bhubaneswar
 - Ruckus Eqpt deployed for better coverage and easy to handle and deploy
 - Ortel Data Customers can access using their username and password
 - Entire connectivity to AP using Optical Fiber
 - Seamless access entire Ortel Locations

Technologies Being Pursued

- City Wifi
 - Bhubaneswar CityWifi part of Odisha Govt Project managed by STPI
 - Participated in the pilot project
 - Seamless access managed with one hour free surfing
 - Coupon system for paid surfing
 - Managed with optical fibre till lastmile
 - Invention system manages BW.
- GPON/EPON
 - FTTH Network used for GPON/EPON Eqpt
 - BW managed by Invention Server.
 - GPON uses optical wavelength division multiplexing (WDM)
 - Wavelength 1490 and 1310 used for data and 1550 for Digital TV

Rural Broadband

- Using FTTH solution from Panchayat to Village
- Optical Line Terminator(OLT) at Panchayat and Optical Network Terminal (ONT) at Each Village.
- Extending Gigabit Ethernet from ONT to Hotspot
- Govt. has to provide 2Gbps links including international bandwidth free of cost.
- Govt. has also to provide the capex to install the Hotspots.
- Ortel will provide manpower for each Panchayat to maintain the hotspots.
- Ortel will install the hotspots for data use through proper AAA mechanism which includes kiosk, package, security and recharge management provisions.
- Optionally Ortel can also use part of this infra to provide TV services and incurring additional capex and opex on its own.

NMS/Provisioning System

- In-house ERP
- SNMP based [Data Provisioning](#) / [CM Monitoring](#) & [node tracking](#)
- Centralized intranet and decentralized internet control
- Centralized [CRM](#)
- Customer uses own page for [monitoring data](#)
- In-house [SMS](#) for digital video
- Oracle 11g used for database
- 264,000 public IPv4 IPs issued from APNIC for data
- Obtained IPv6 pool:2406:0c00::/32 from APNIC
- Using own NS and domain server
- IP commander used for data and VOIP provisioning
- Invention duly integrated with ERP used for MEN, WiFi & EOC application
- Web Based Node Mapping and Diagram using GIS Data.
- [GIS](#) Survey undertaken for all new areas.



Technology Challenges

- Countering LTE and 4G for Mobility
- Regulatory Hurdle for Interconnectivity between PSTN and VOIP
- FTTH: Still Expensive
- IPTV: Still very Expensive

**Thank
You**