

CHANNELOT

Mobile TV Backhaul





Motivation

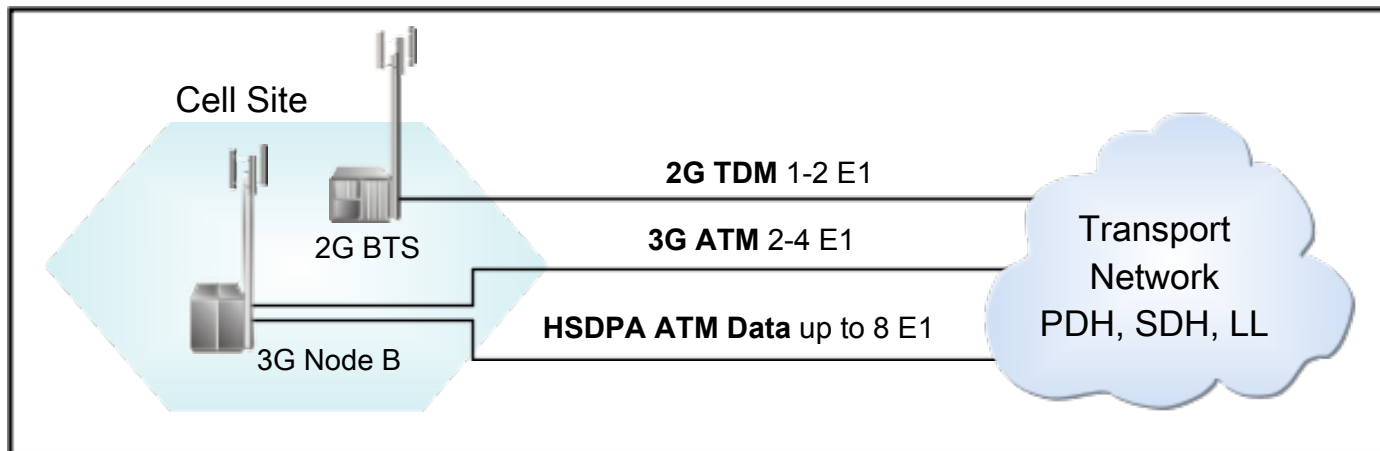
- Large-scale deployment of DVB-H will call for a large number of low-power transmitter sites; those are likely to be co-located with cellular base-stations
- Signal distribution to the transmitters is a major issue
- Satellite distribution is often the answer. However:
- Integrating mobile TV distribution into the cellular backhaul network may be a low incremental-cost alternative





Cellular Backhaul Evolution

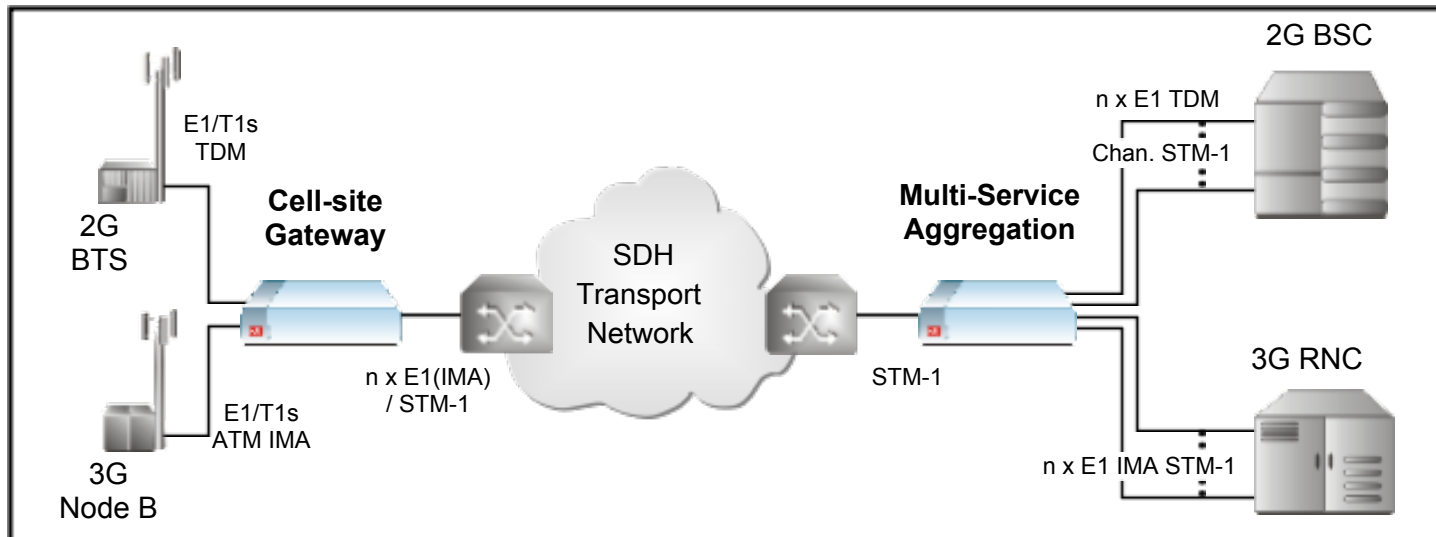
- Second Generation (2G)
 - Channelized E1/T1
- Third Generation (3G)
 - Inverse Multiplexing ATM (IMA) over E1/T1
- “Third and a Half” Generation (3.5G, HSDPA)
 - Inverse Multiplexing ATM (IMA) over E1/T1
 - High but variable rate; more delay- and loss-tolerant





Cellular Backhaul Optimization

- TDM channel grooming
- Quality-aware statistical multiplexing (over-subscription) of 3/3.5G data services
- Aggregation over a unified transport





Optimization Looking Forward

- Adding native IP traffic from 3G+ IP-RAN
- Packet-based transport Network – Ethernet services
 - Using pseudo-wire to emulate TDM connections over packet
 - Traffic management to maintain quality of service
- DSL access from the base-station site
 - Leveraging cost-effective access infrastructure
 - Line bonding to scale up capacity



DVB-H Backhaul Requirements

- Native IP data
 - Almost all of it one-way video from head-end to transmitter site
 - Minimal amount of two-way management
- 5 Mbps per DVB-H multiplex (RF channel)
- Service characteristics and requirements
 - Constant bit rate
 - Large packets
 - Sensitive to packet loss
 - Moderately sensitive to delay and jitter



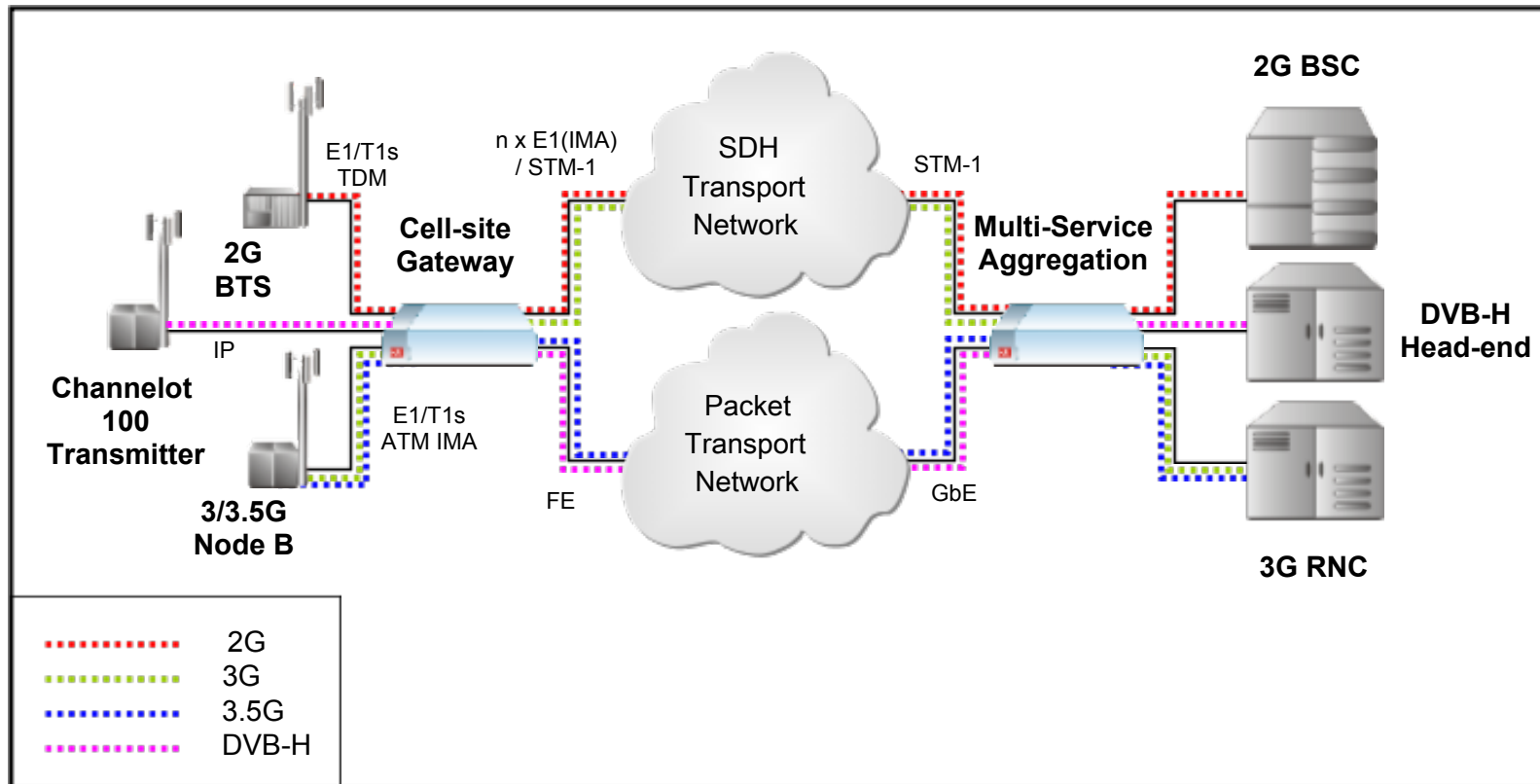
Backhaul Aggregation

- DVB-H distribution can and should be brought into the aggregation equipment on the network side, and delivered through the same cell-site gateway
- Transport
 - IP over SDH
 - Native packet over packet transport
- Together with 3.5G HSDPA backhaul, it can lead the gradual migration to packet transport (see diagram on next slide)



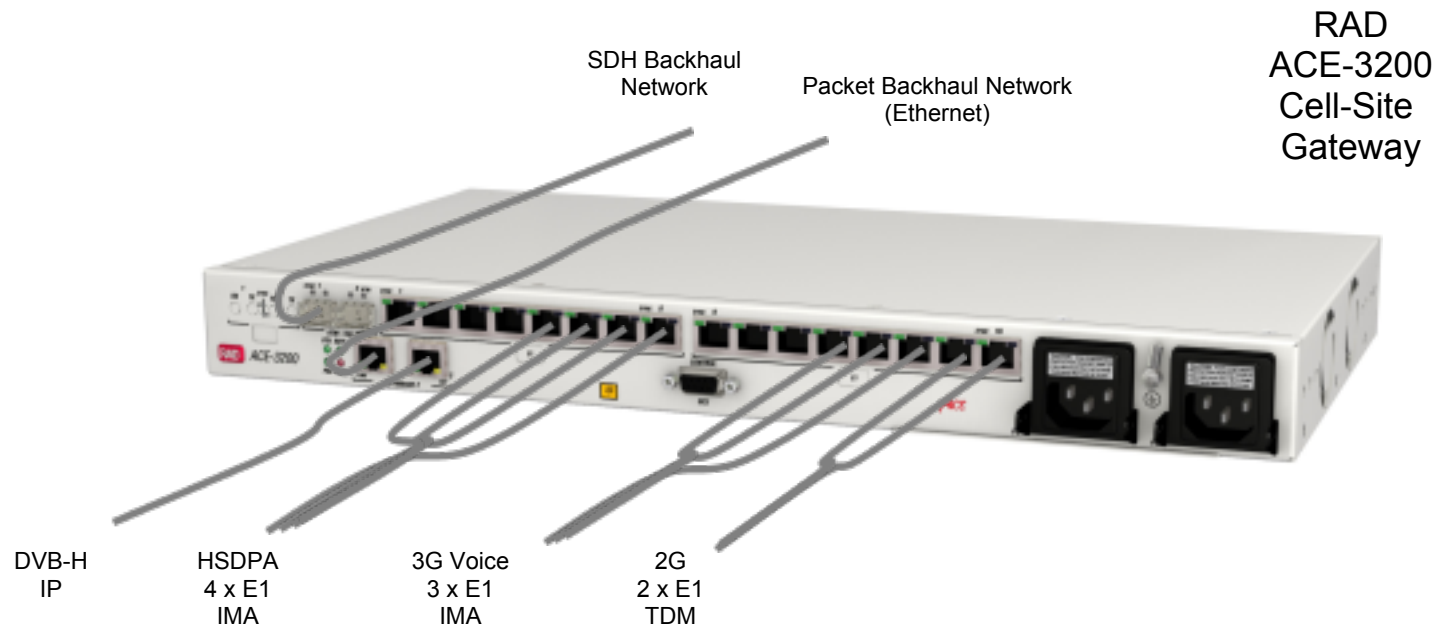
Backhaul Integration Example

- SDH to packet migration scenario





Cell-Site Solution Example





ACE 3100/3200 Cell-Site Gateway

- A single cell-site gateway integrates and optimizes cellular backhaul traffic – across technology generations – as well as mobile TV
- TDM, ATM UNI, IMA and Ethernet input ports
- SDH and packet uplinks
- Traffic optimization by channel grooming and quality-aware statistical-multiplexing
- Pseudo-wire transport over a packet backhaul
- Synchronization through the network as an alternative to GPS
- Carrier-grade manageability and fault tolerance



ACE 3400/3600 Gateways

- Traffic aggregation at a network aggregation point or at the BSC/RNC site
- Full set of capabilities across cellular as well as transport technology generations:
- SDH or packet transport termination
- TDM, SDH or packet uplinks

