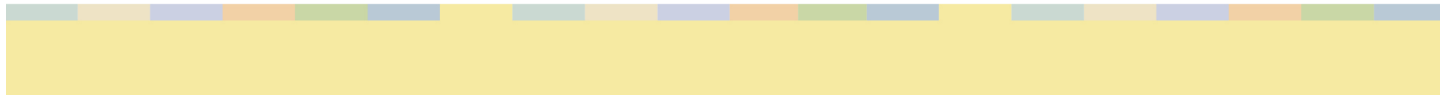
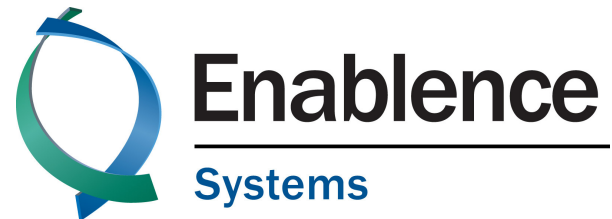
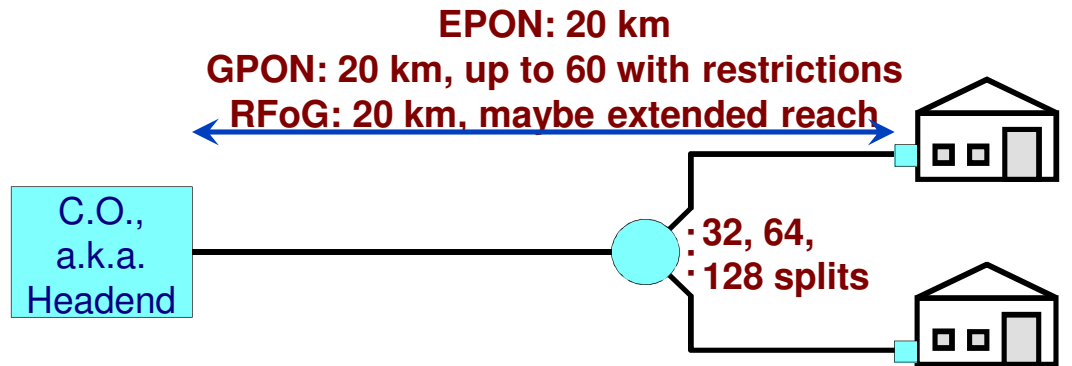


The Fiber-to-the-Home Landscape: Cable TV on Steroids

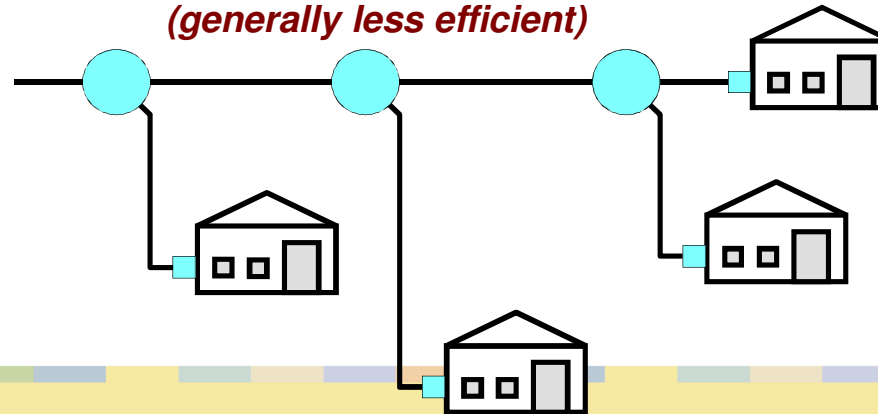
James O. "Jim" Farmer
Enablence Systems
Alpharetta, Georgia, USA



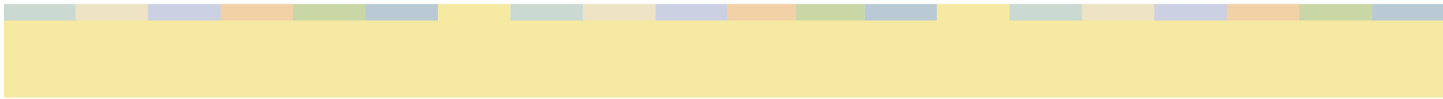
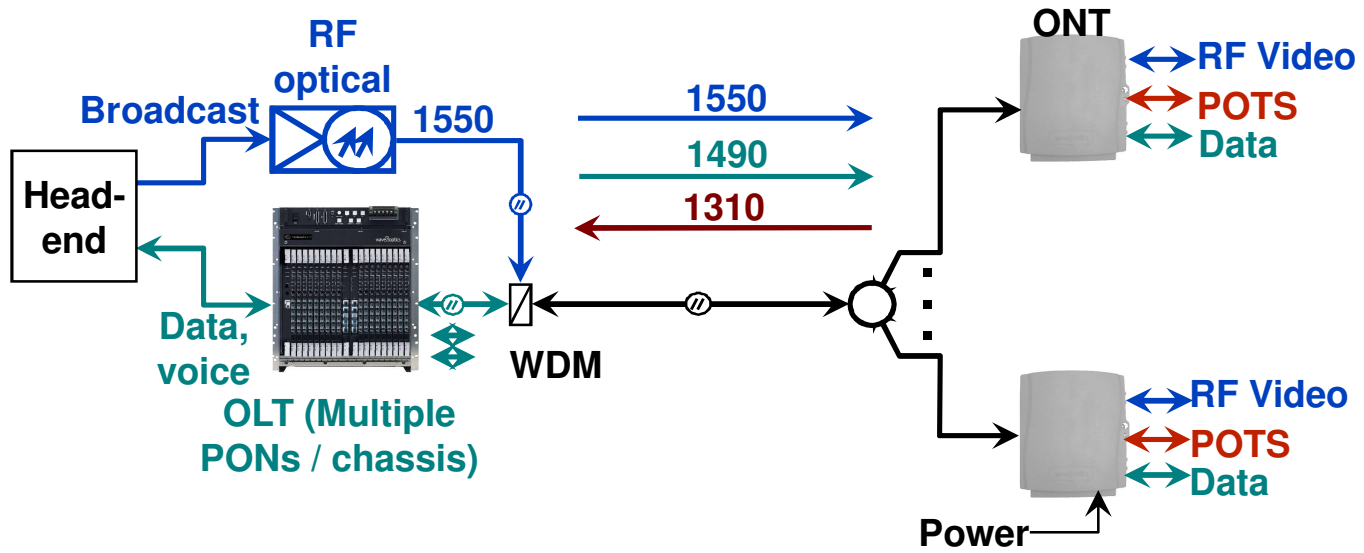
What do the networks look like?



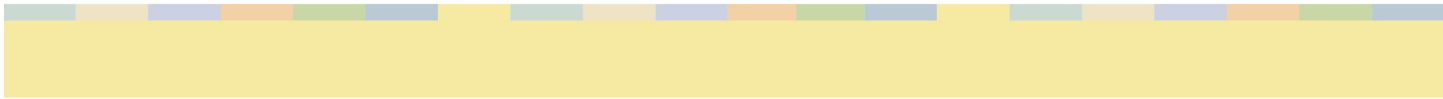
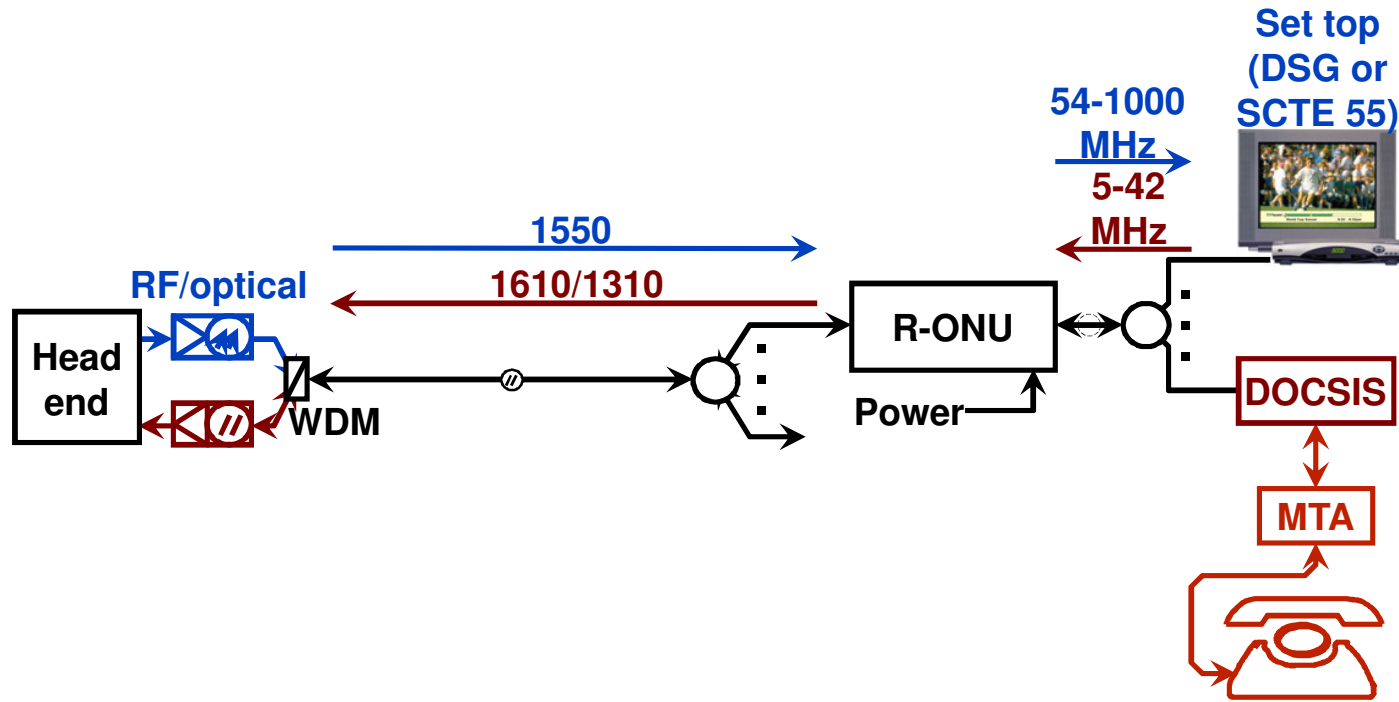
*Or, a tapped architecture
(generally less efficient)*



G/E-PON network

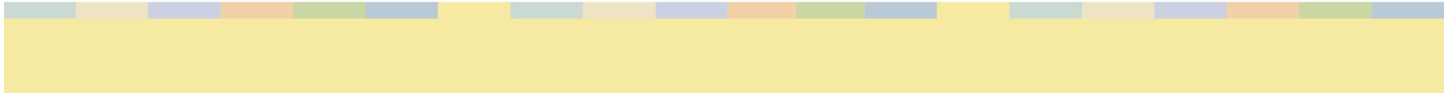
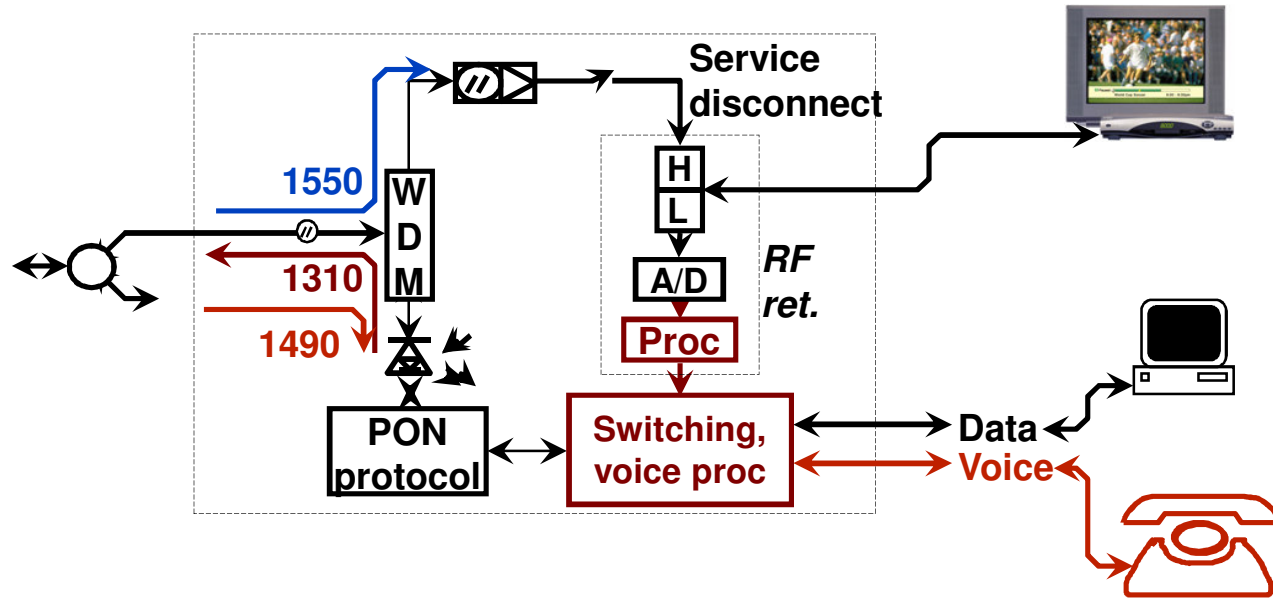


RFoG network



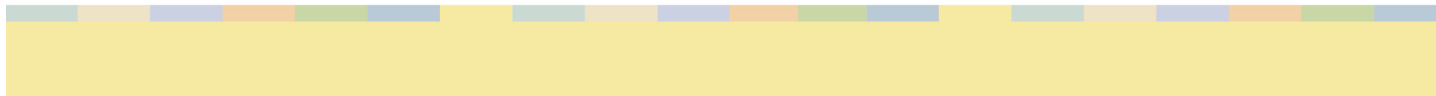
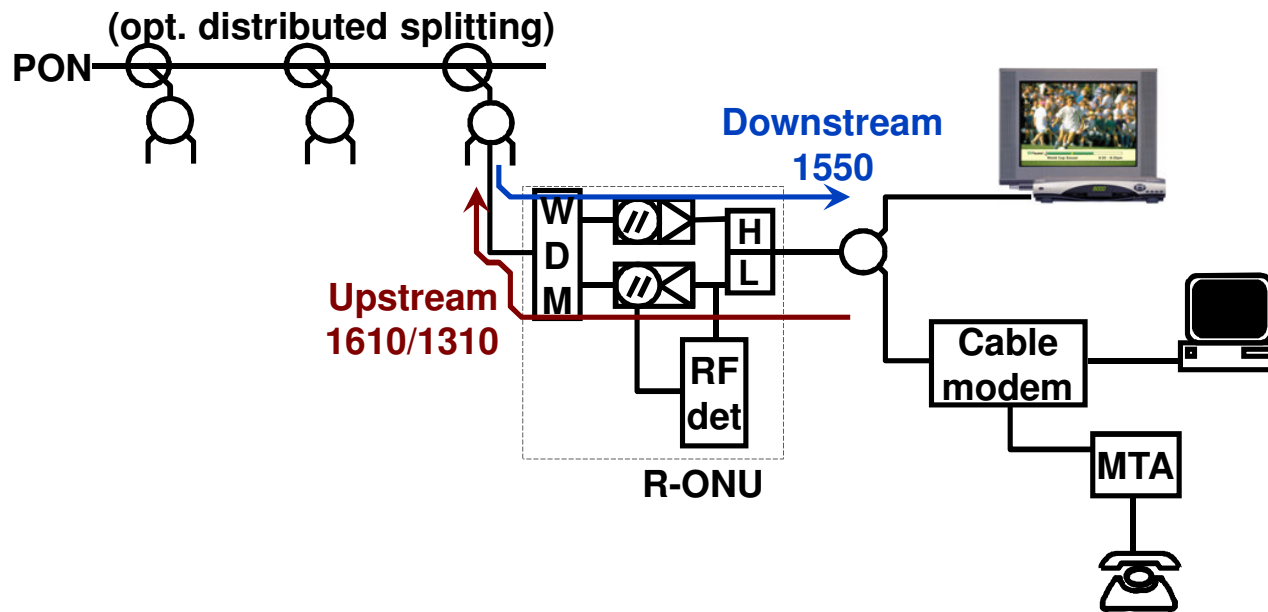
G/E-PON ONT

(Fully featured)

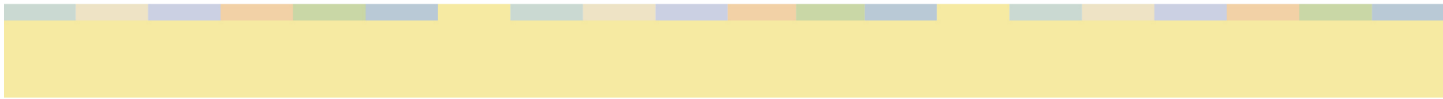
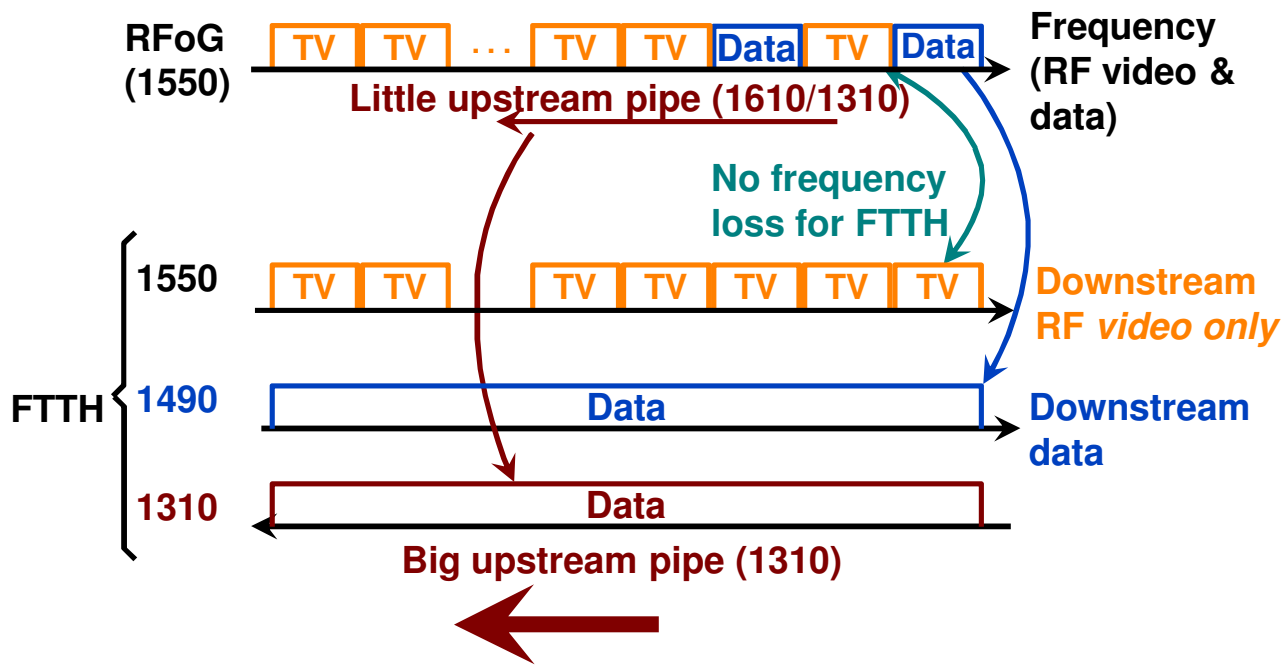


RFoG R-ONU

(RFoG - optical network unit)



G/E-PON and RFoG transport



Downstream data rate comparison



	Peak rate Mb/s	Avg rate Mb/s	Pgms lost
EPON	1000	31	0
GPON	2400	75	0
RFoG DOCSIS, 1 ch	38	0.23	10
RFoG DOCSIS, 4 ch	150	0.92	40

DOCSIS assumes 165 subscribers per channel, G/E-PON 32

Upstream data rate comparison



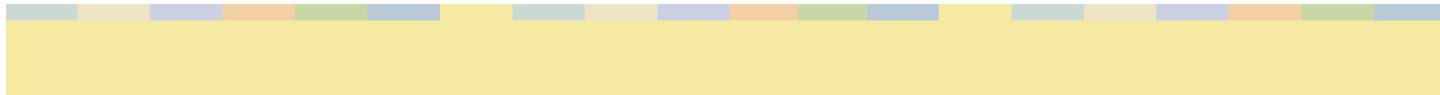
	Peak rate Mb/s	Avg rate Mb/s
EPON	1000	31
GPON	1200	37
RFoG DOCSIS, 1 ch	10	0.07
RFoG DOCSIS, 4 ch	120	0.73

DOCSIS assumes 165 subscribers per channel, G/E-PON 32

Who is building FTTH?



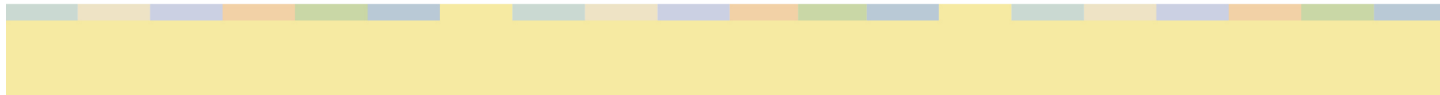
- Verizon, selected markets (FIOS)
- Local muni, frequently through owned utility
 - Jackson, TN
 - Pulaski, TN
 - Chattanooga, TN
 - Lafayette, LA
- Independent telco
 - Comporium (Rock Hill, SC)
 - Hancock (south of Indianapolis)
 - Columbus Telephone (KS)
 - Tullahoma, TN
- Independent competitive overbuilder
 - En-touch (Houston)
- Cable TV
 - CableOne
 - Harris Broadband



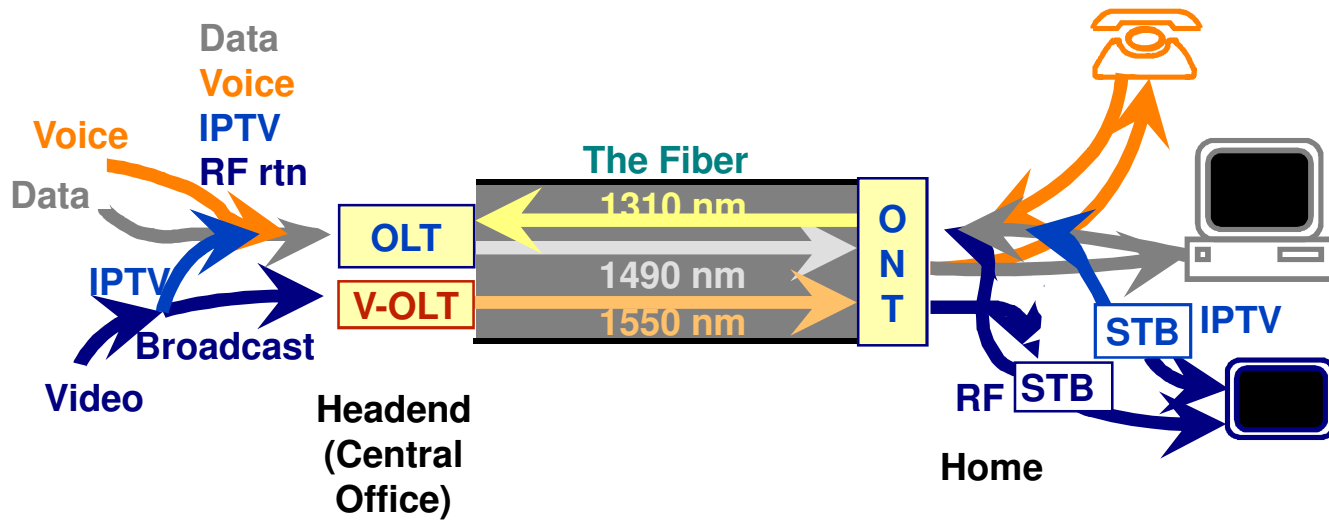
Status of builds



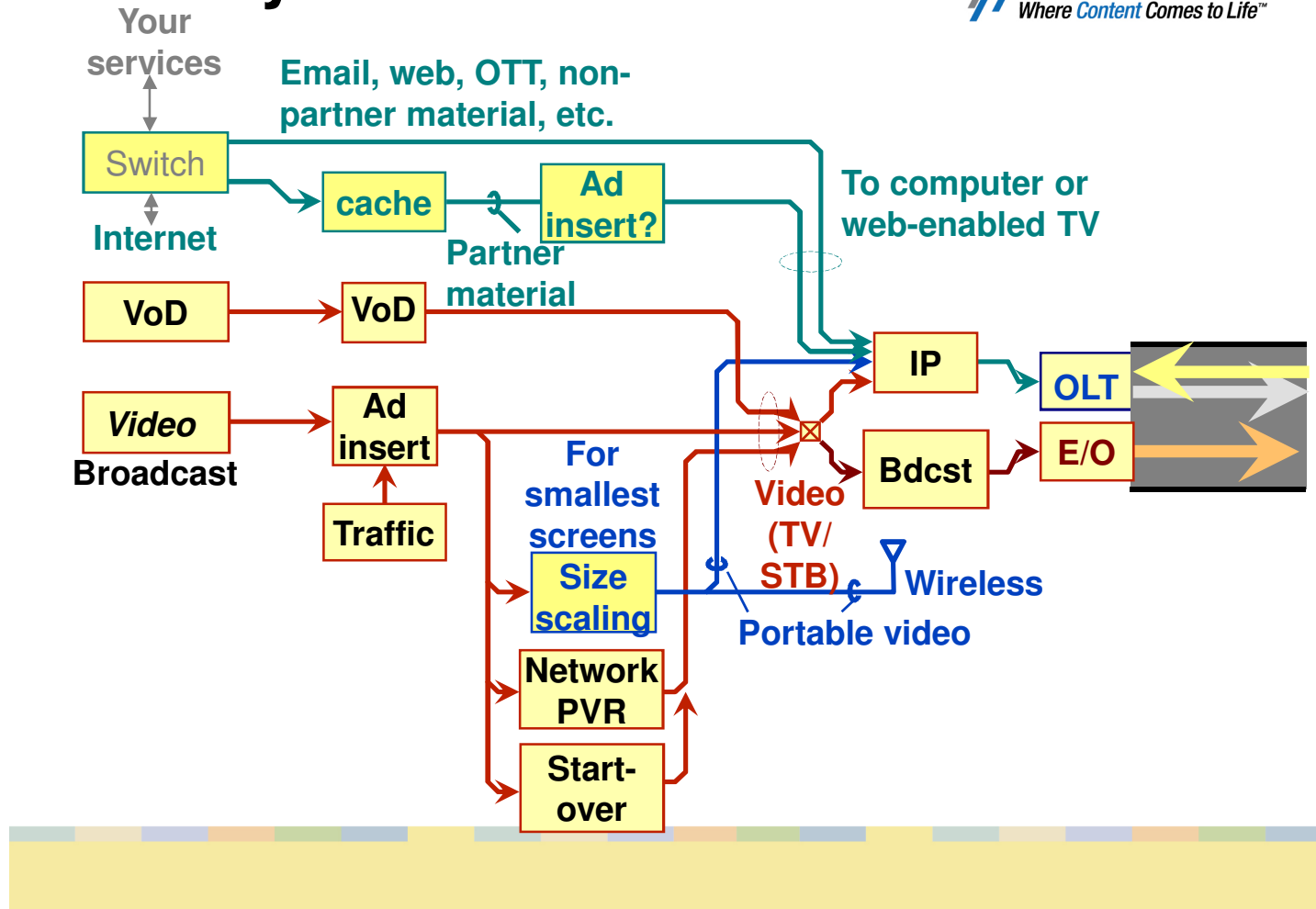
- Telcos are mostly greenfield and where they had old plant in need or replacement
 - Columbus, KS converted entire city, all 1 square mile of it, to FTTH
 - Verizon FiOS is overbuilding their copper plant
- Muni-owned is mostly overbuild of existing suppliers because existing suppliers were not seen as doing the job
- Cable is just starting
 - So far greenfield only, mix of EPON and RFoG
 - Working on customized DOCSIS-based management standards



The Good Ole Days



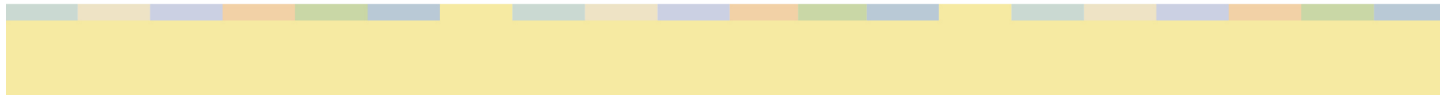
Today



New services



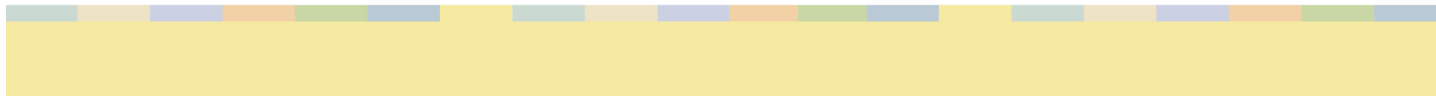
- Both IPTV and broadcast possible
 - Not all operators are using broadcast, though many are
 - All are handling over-the-top (OTT) video
 - Like it or not
 - Easy (!?!) to target all three wired screens
 - IPTV can reduce the cost of video-on-demand
 - Target computer and portable screens
 - Increasingly target TV



Possible Cooperation with Local FTTH Provider



- Backhaul video
 - Anywhere he has an optical tap and can put an ONT, you have a Gb/s backhaul facility
- Provide OTT video cached at his facility
 - Full SD or HD
 - Local news on demand (with commercials?)
 - Local public service programs
 - Entertainment programs where rights exist
 - Local interest video for which you don't have air time
 - Package shows for "grab-n-go"





Th..th..th..th..that's all folks

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