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EXPO'13
OCTOBER 21-24 / ATLANTA, GA

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Rollout of Cable-UHDTV in Japan

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Agenda

- ▶ Cable TV status in Japan
- ▶ Cable in full digital age
- ▶ Next Generation TV
- ▶ UHDTV (Ultra High Definition)
- ▶ UHDTV Implementation Schedule
- ▶ Cable UHDTV Deployment
- ▶ Summary



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Cable TV Adoption in Japan Now

- ▶ Cable connected home 52% (27M HH)
- ▶ Cable STB connected 15% (8M HH)
- ▶ Cable Broadband (BB) 10% (5M HH)
- ▶ Cable penetration is high, but cable BB is not major due to heavy competition with telco's FTTH
- ▶ One MSO share is more than 50%
 - 300 companies share remainder



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Full Digital Cable and Beyond

- ▶ Digital Terrestrial TV, 100%, migrated in 2012
- ▶ Cable Digital/Analog conversion service till 2015
 - Deadline is mandated by law
- ▶ HDTV is part of basic service in cable
- ▶ Emerging IPTV, OTT are creating fierce competition

What is next for cable to compete for consumers' demands?



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Answer: Next Generation TV!

- ▶ Japanese Government released next generation television implementation plan in June 2013
- ▶ Three elements are included
 1. UHD TV or Ultra High Definition Television (4K, 8K)
 2. Smart TV: Hybridcast (NHK), HbbTV* (EU)
 3. IP Video: VOD + LinearTV, cable-OTT

**HbbTV: Hybrid broadcast broadband TV, which integrates broadcast, IPTV and broadband delivery of video to consumer via connected TVs and STBs*

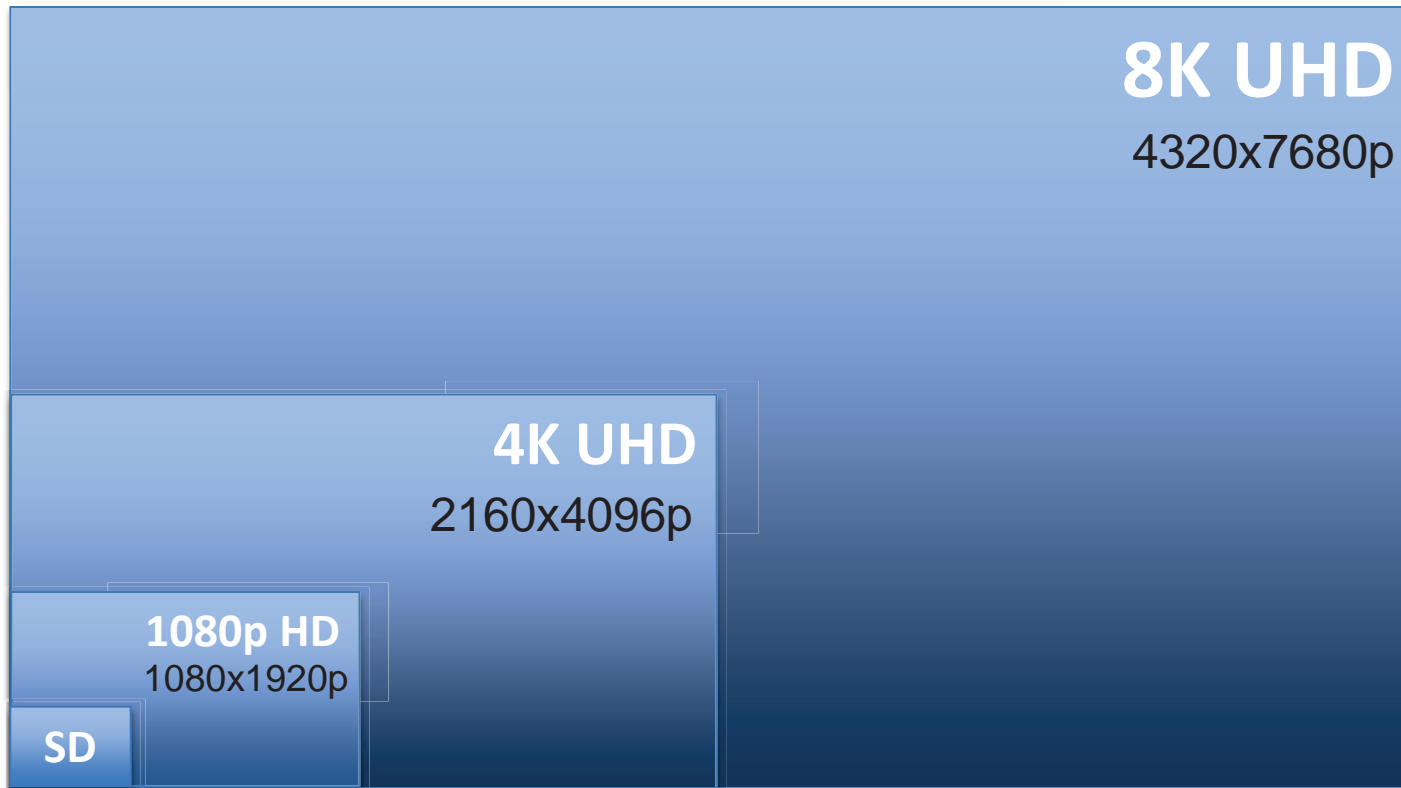


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UHDTV 4K/8K



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Rollout schedule of UHD TV

- ▶ 2014: year of World Cup - **4K broadcasting test**
- ▶ 2016: year of Rio Olympic - **8K broadcasting test**
- ▶ 2020: year of Tokyo Olympic - **8K broadcasting**
- ▶ 2K/4K/8K compatible TV set will be ready by 2020
- ▶ Test broadcasting will be by:
 - Satellite, cable, IPTV
 - Perhaps also terrestrial
- ▶ 4K/8K is new service rather than migration
 - Incumbents may remain



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4K/8K via Cable: Technical Details

Required bps: 4K with HEVC 30-40 Mbps, 8K with HEVC 70-90 Mbps

Mode of Delivery	Cable	Transmission technology
IP Video	HFC	DOCSIS 3.0 channel bonding <<<<<<DOCSIS 3.1
	FTTH	GE-PON or DOCSIS by RFoG
RF Broadcasting	HFC, FTTH	Digital cable 256/64 QAM channel bonding <<<<<<<<< 1024/4096 QAM, OFDM (DVB-C2 basis)
	FTTH	Satellite IF pass through Above 1GHz



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Summary

- ▶ Cable must provide new services in full digital era
- ▶ UHD TV as next killer app to meet consumer demand
- ▶ UHD TV expected to roll out globally over time
 - Test service will start in 2014 in Japan!
- ▶ Cable UHD TV deployment requires advanced PHY:
 - OFDM-based technology (DOCSIS 3.1/DVB-C2) required to deploy UHD TV on current networks at higher spectral efficiency





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