

**SCTE CABLE-TEC**  
**EXPO<sup>®</sup>'13**  
OCTOBER 21-24 / ATLANTA, GA

# LEVERAGING FULL BAND CAPTURE TO IMPROVE THE CUSTOMER EXPERIENCE AND OPERATIONAL PERFORMANCE

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# Agenda

- ▶ Introduction
- ▶ FBC: The What/How/Why
- ▶ New Capabilities
- ▶ Advanced Diagnostics
- ▶ Business and Operational Intelligence Possibilities
- ▶ Predictive Analytics
- ▶ Benefits of FBC
- ▶ Conclusion



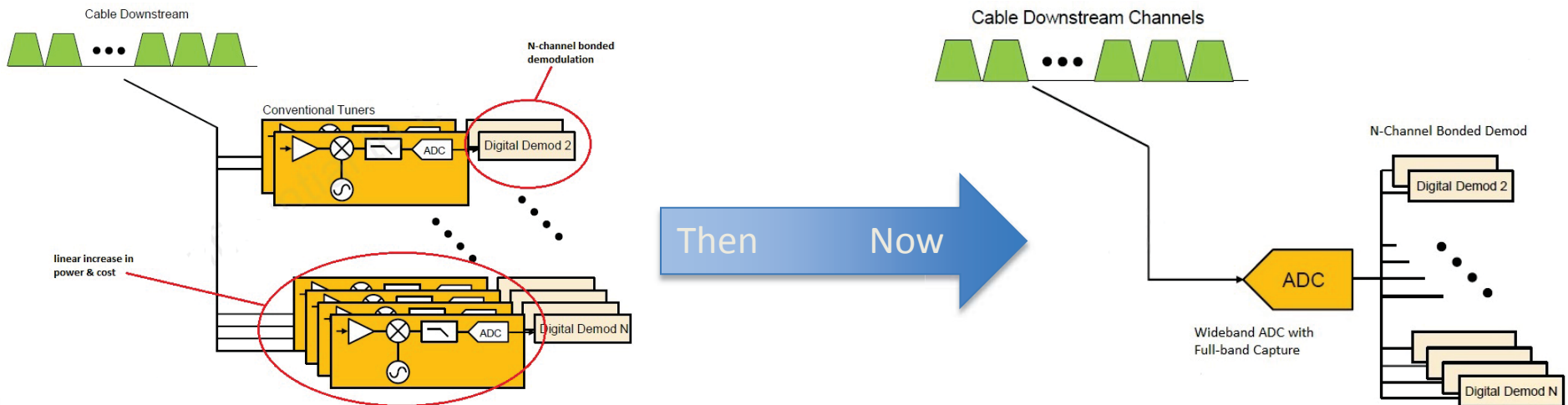
# FBC – The What

- ▶ Captures the entire DS spectrum at the CPE
  - Digitizes the RF spectrum
  - Non-service impacting to the customer
- ▶ Eliminates traditional analog tuner concept
- ▶ Any channel for any service
- ▶ Delivers spectrum analysis at the CPE
  - In-chip memory and HW provide processing for SA
  - SA data used locally or remotely via SNMP



# FBC – The How

- ▶ Front-end digital tuner captures entire DS spectrum (54-1002 MHz)
- ▶ Digital tuning replaces traditional tuner concepts
- ▶ Converts the analog signal to a digital signal for advanced data processing



# FBC – The Why

- ▶ Service deployment flexibility
- ▶ Digital signal enables advanced signal processing techniques
- ▶ Overcomes limitations of existing analog CPE designs
- ▶ Reduces cost of implementation, power requirements and design footprint
- ▶ Full spectrum capture and analysis of DS signal



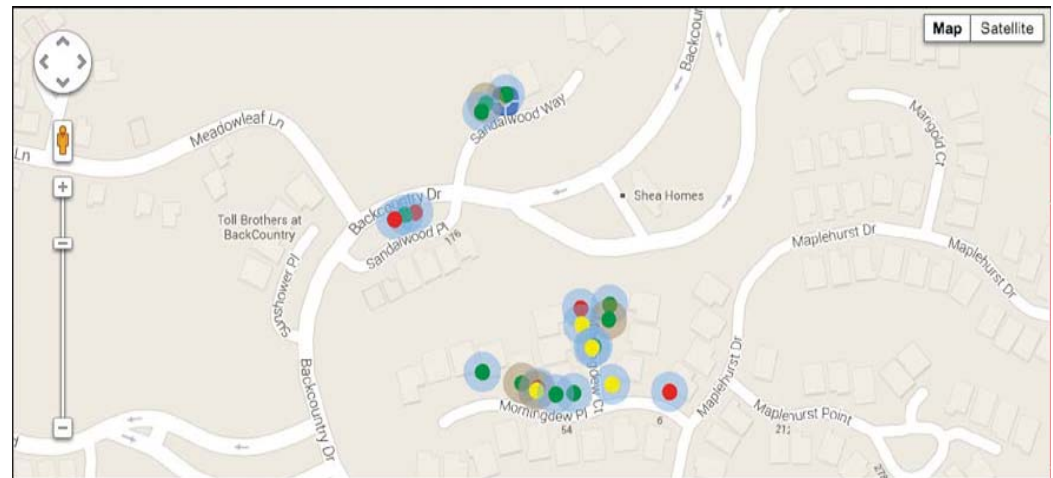
# New Capabilities

- ▶ FBC Chipsets can facilitate improved service reliability and QoS for your subscribers.
- ▶ Visibility into full spectrum, including the video frequencies, enables:
  - Non-intrusive, actionable, remote spectrum analytics not previously available.
  - Preemptive, noninvasive troubleshooting of RF issues.
  - The establishment of empirical data regarding node health for the full forward spectrum.



# Advanced Diagnostics

- ▶ Spectrum data throughout the network
- ▶ Construct spectral maps of the access network
- ▶ Real-time RF capture to facilitate immediate, intelligent decisions
- ▶ Proactive, targeted problem resolution



# Business Intelligence Possibilities

- ▶ Some sample spectrum reports for your internal support teams and executives:
  - Intraday node status based on spectrum health for one or all three lines of business. CEA status can also be provided for video spectrum.
  - Corrected/Uncorrectable Packet Errors by node and device type.
  - Overall BER, MER, SNR, Channel Equalization etc.
  - 24 hour, weekly, and monthly network availability uptime based on empirical knowledge/spectrum variances.
  - Firmware deployments & potential impacts can be tracked and reported on.

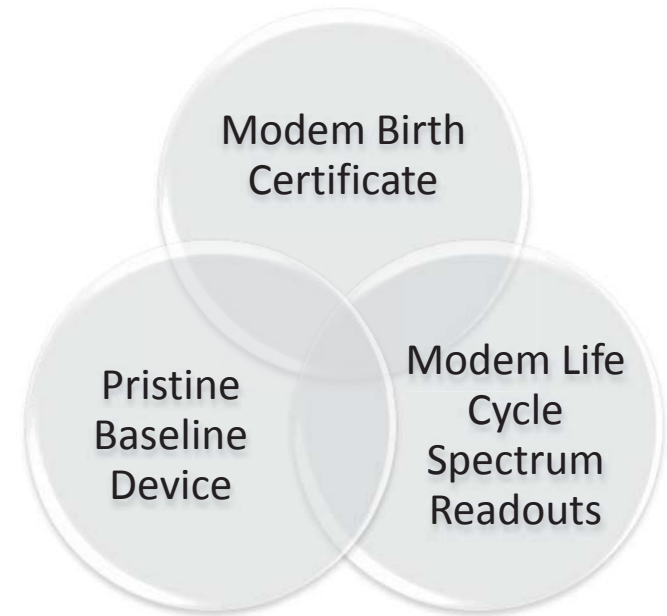




# Operational Intelligence Possibilities

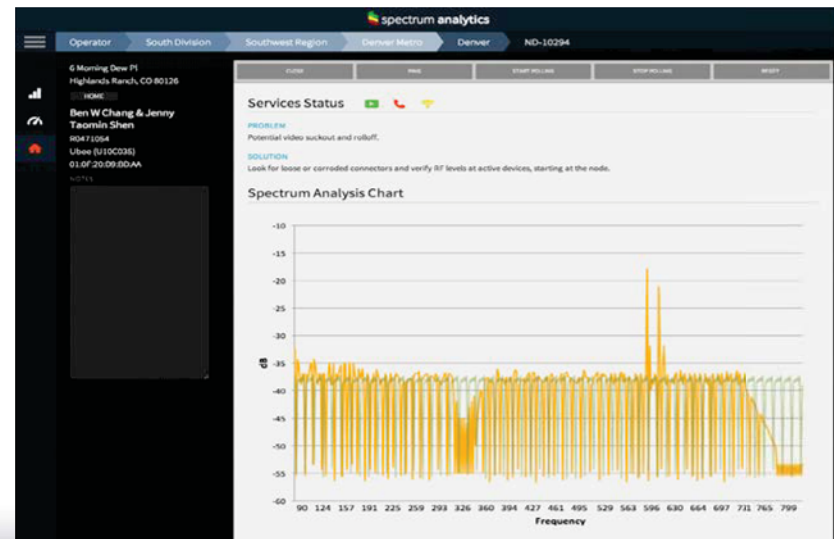
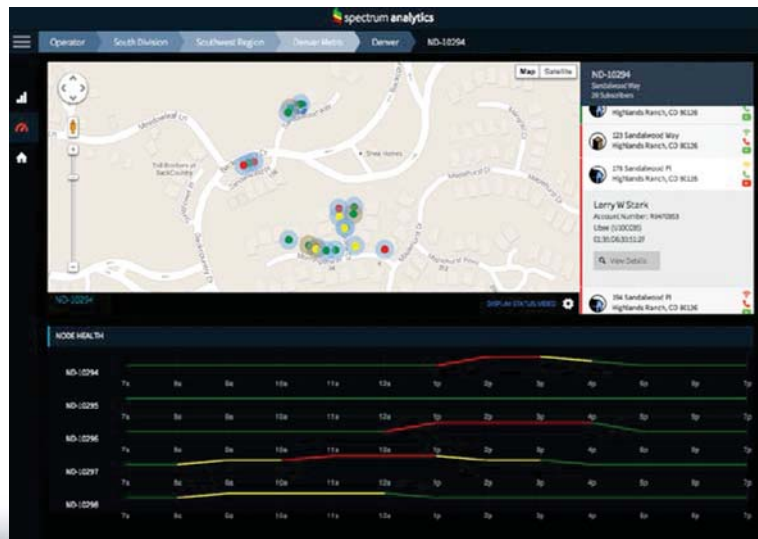
Device Signature Profile +  
Daily Spectrum Triangulation =  
Operational Intelligence:

- Detailed spectrum variance alerts in deployed devices when compared back to the baseline device & birth certificate.
- Analysis of recurring problems with certain modem models or firmware.
- Understanding of LTE Interference that may drive FCC fines.



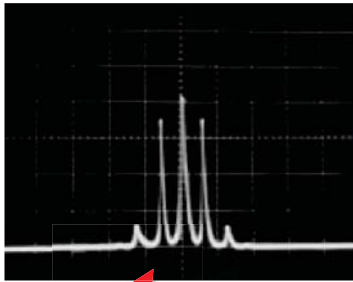
# Operational Intelligence Possibilities

- ▶ Spectrum Health Status by Product - Variances can be displayed geographically by customer type – residential, MDU or commercial and by line of business – video, internet, telephony.
  - Graphical readouts of the spectrum can be provided to assist with troubleshooting customer impacting issues.
  - Recommended solutions can be provided to minimize time to repair.



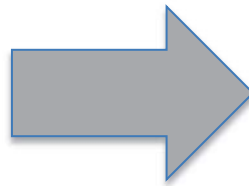
# Predictive Analytics

Live Customer Modem Spectrum Analysis

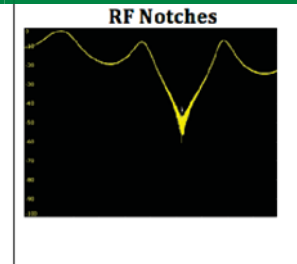
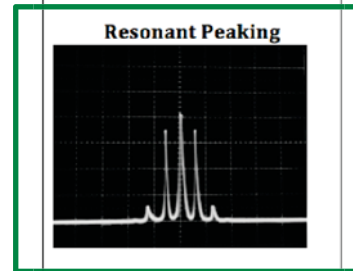
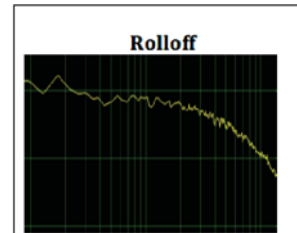


Identify Variance At Inception

Comparison to Variance Catalog in DW



Match to Resonant Peaking



Proactive Alert to Engineering & Tech Ops



# Benefits of FBC

- ▶ Reduction in broad footprint
- ▶ Increases ability to support industry performance requirements
- ▶ Increases ability for data processing & analysis
- ▶ Overall power requirements are reduced
- ▶ Deployment flexibility for Operators



# Benefits Continued

- ▶ Evolution from a service centric to a customer centric approach.
- ▶ Empirical data regarding node health for full forward spectrum.
- ▶ Remote analysis/troubleshooting of spectrum for all HHP.
- ▶ Increased service reliability, decreased truck rolls and calls into the call center.
- ▶ Performance baselines and trend monitoring.



# Conclusion

- ▶ Implementation of Front End Digital Tuners can facilitate the capture of downstream spectrum
- ▶ Proactive RF Analysis can detect physical problems to reduce service calls and improve service reliability
- ▶ The use of spectrum analytics can help you preemptively identify and address full band spectrum variances
- ▶ Reduce costs, increase operational performance and increase customer satisfaction





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