



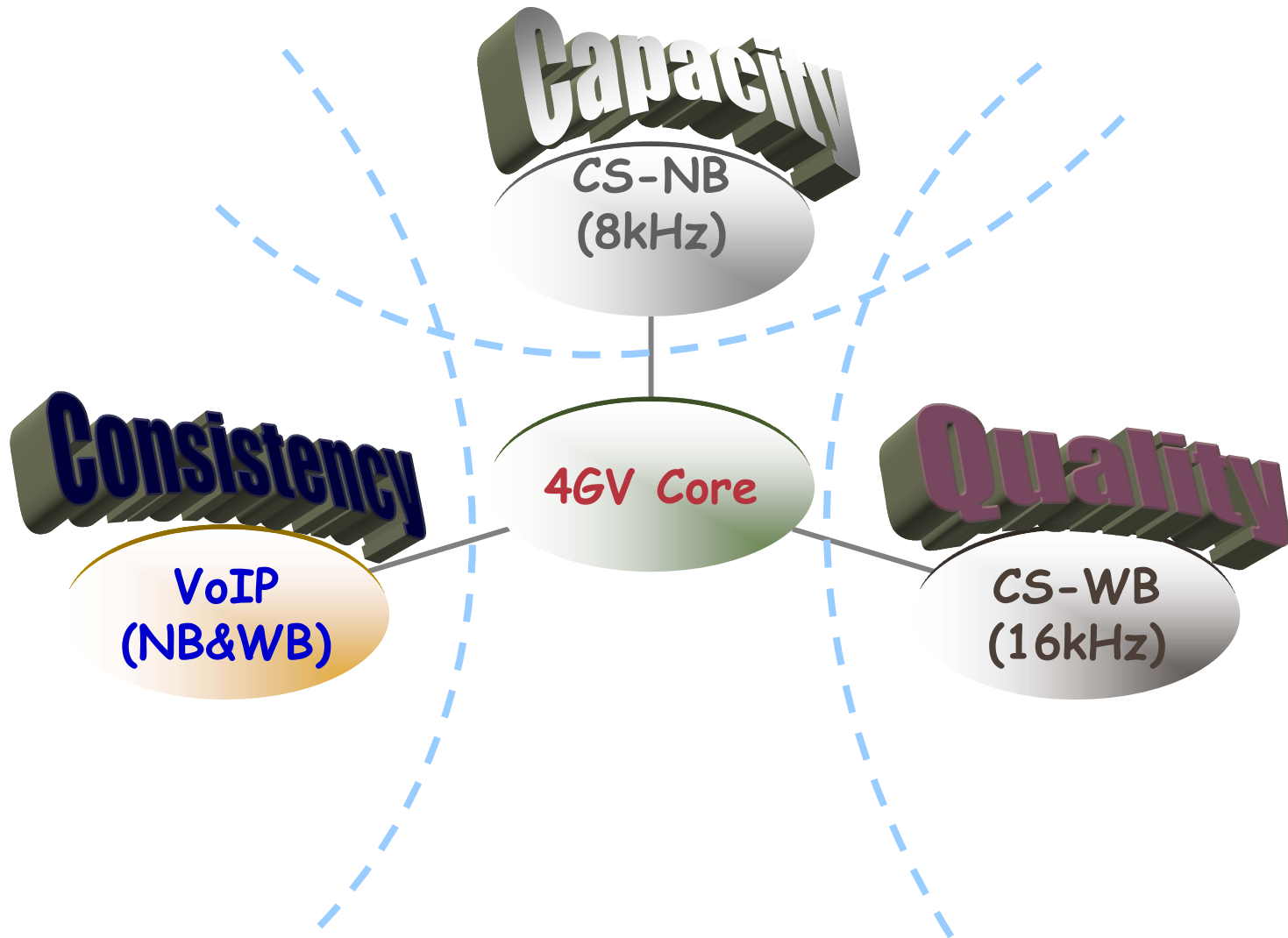
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# **4GV Technology Presentation CDG Forum April 20 2006**

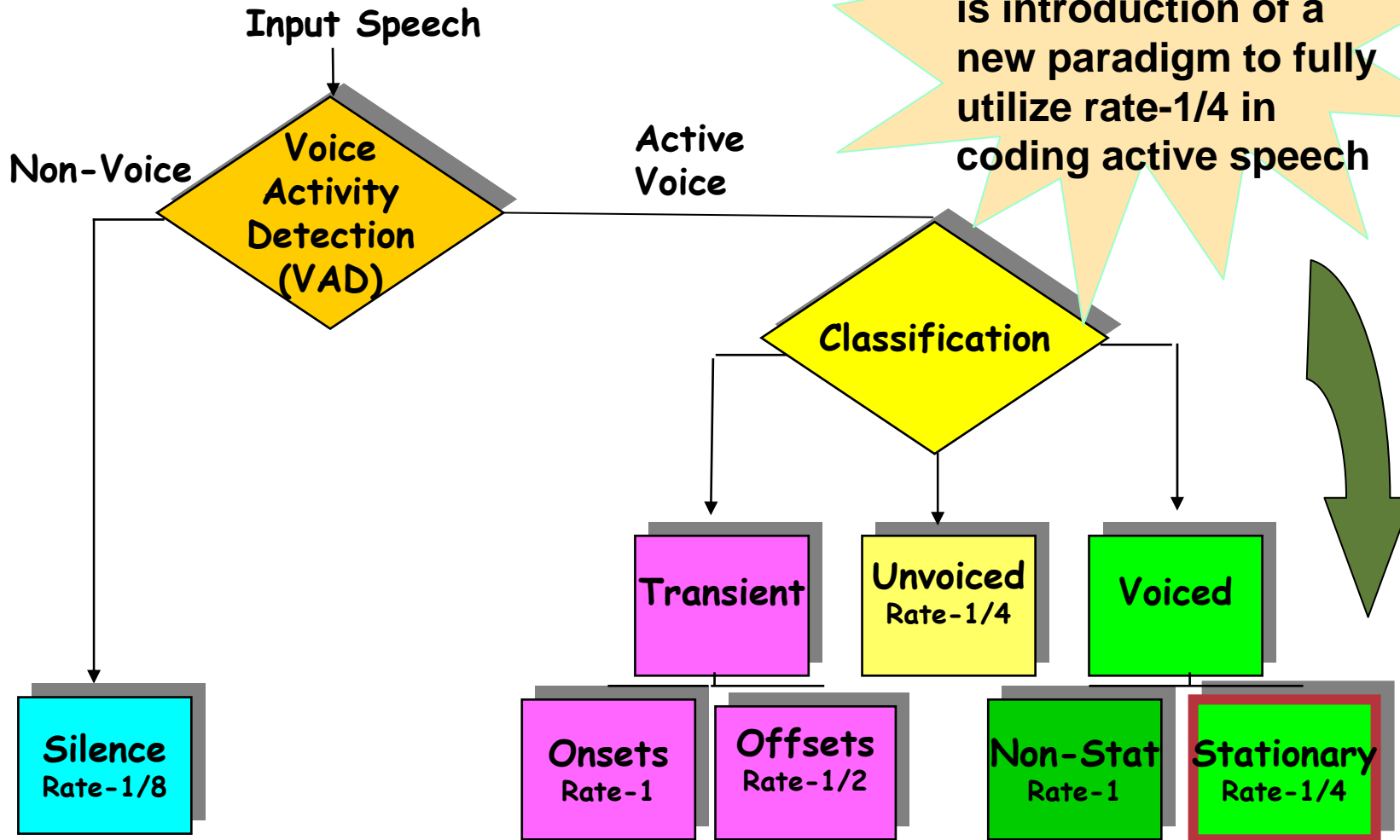
**A. Ryan Heidari  
Qualcomm Technical Marketing Manager  
[rheidari@qualcomm.com](mailto:rheidari@qualcomm.com)**

- **What is 4GV**
  - Narrowband Capacity Saving Extension
  - Wideband Voice Quality Improvement Extension
  - Voice Over Packet Switched Extension
- **Network Dependencies**
- **3GPP2 and IETF Standardization**
- **Summary**

# 4GV™ (4<sup>th</sup> Generation Voice Enablers)



# 4GV VAD & Classification



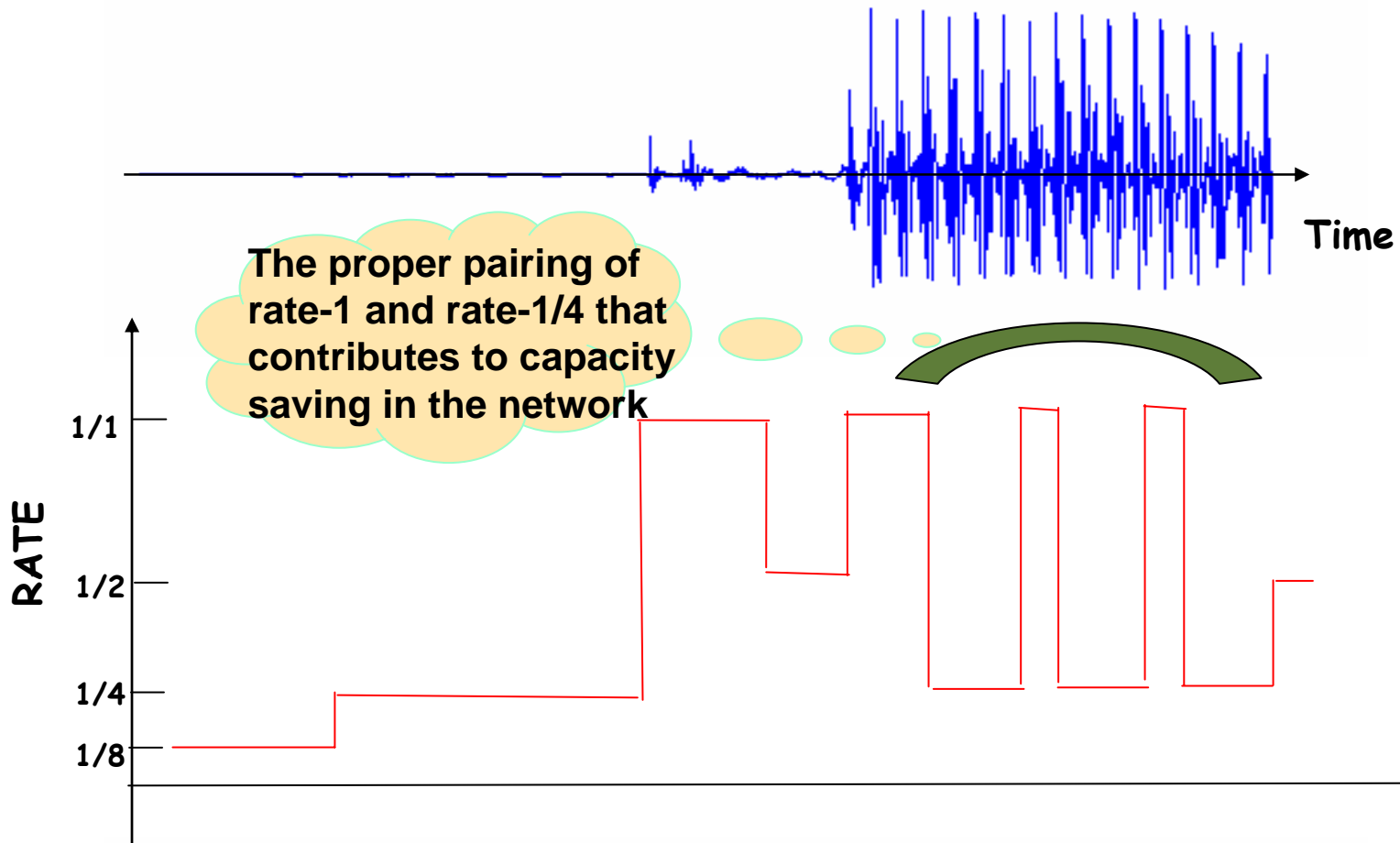
# 4GV VAD & Classification

Silence

Unvoiced

Onset

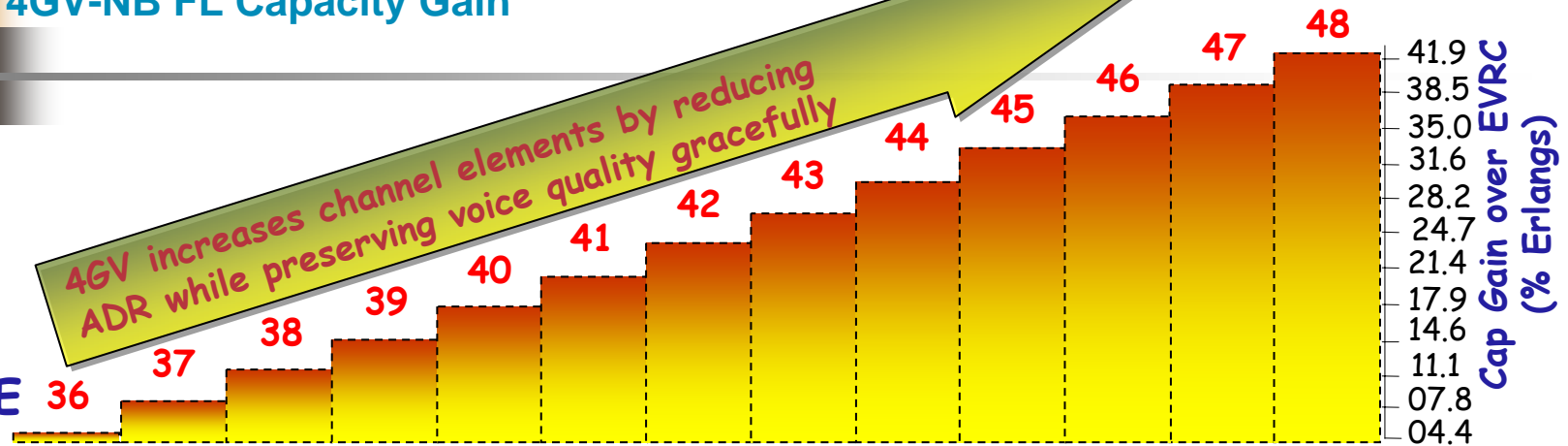
Voiced



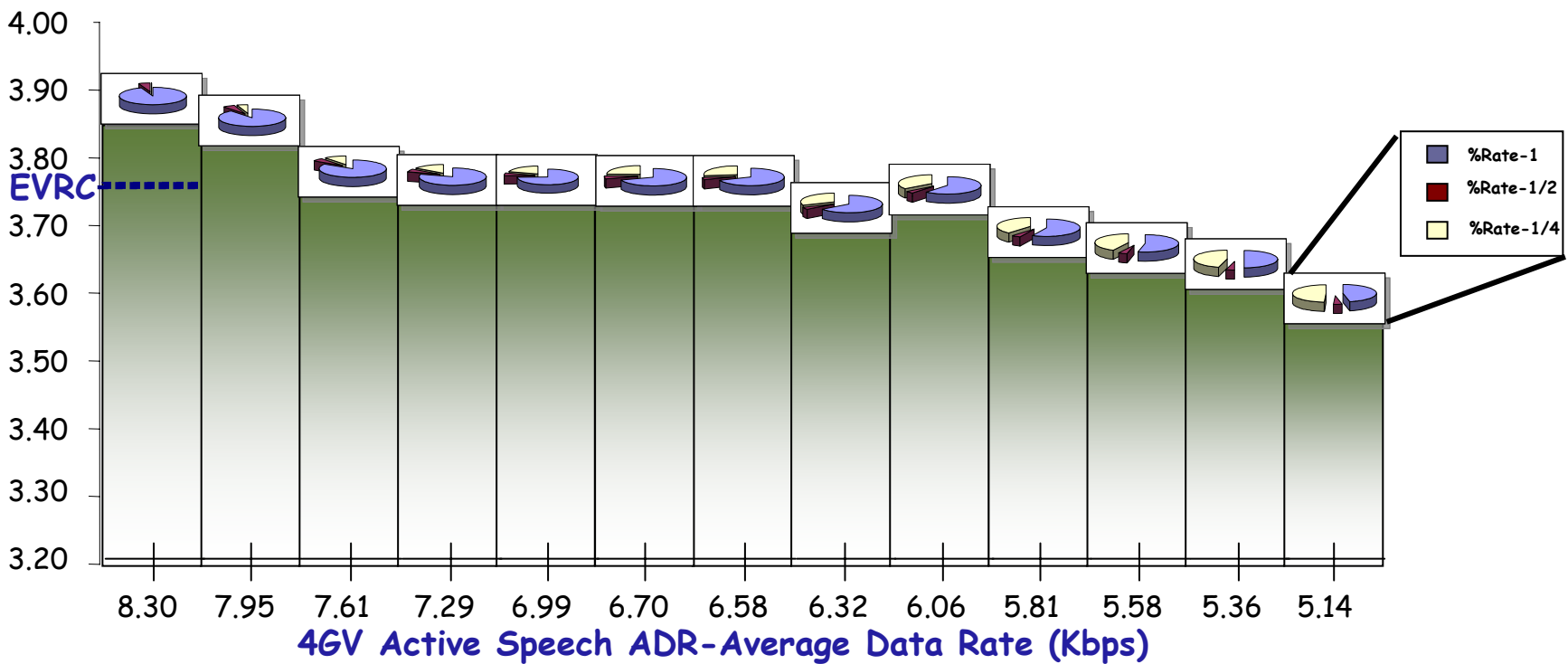
# 4GV-NB FL Capacity Gain

*4GV increases channel elements by reducing ADR while preserving voice quality gracefully*

EVRC CE



Voice Quality 1% FER (MOS)



# 4GV-NB RL Selected Modes & Signaling Protocols

## Service Option Control Message

Field	Length (bits)
RATE_REDUCE	3
RESERVED	3
MOBILE_TO_MOBILE	1
INIT_CODEC	1

## Reverse Link

### Only Eight Possible COP

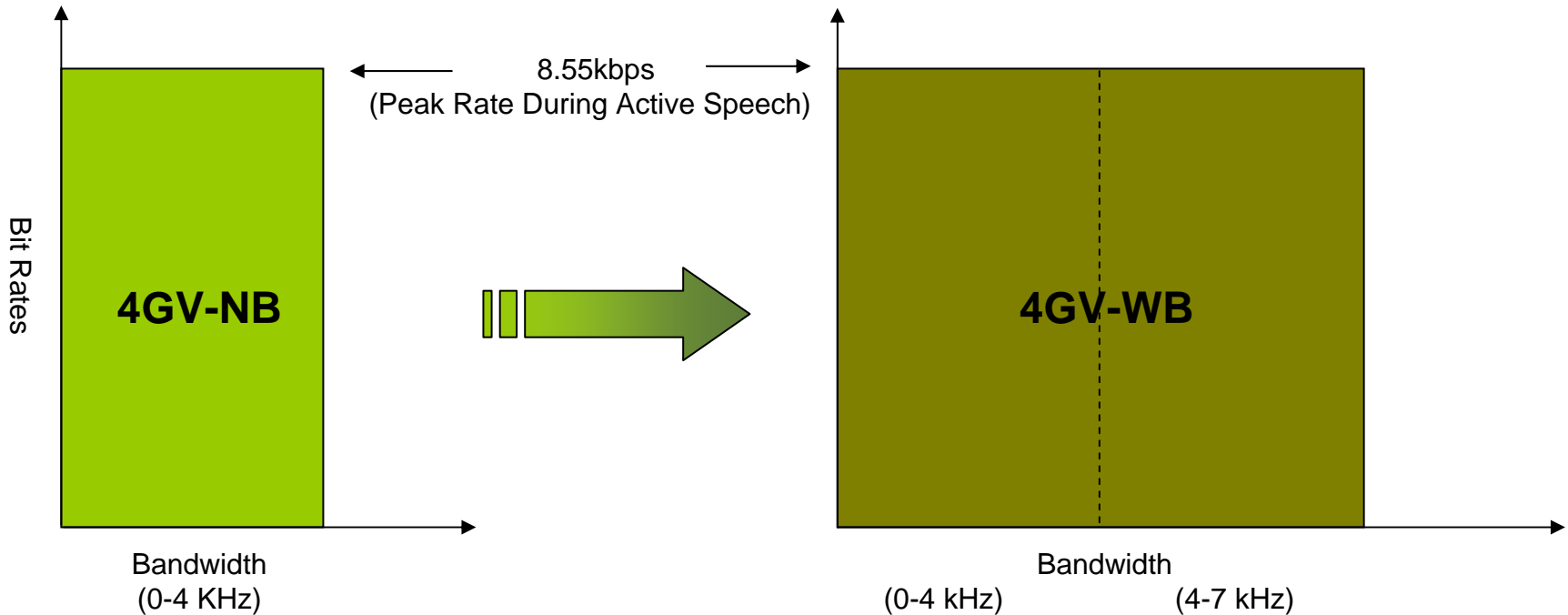
RATE_REDUCE (binary) (Modes)	Active Channel (Rate-ADR) (Kbps)
'000'	8.30
'001'	7.57
'010'	6.64
'011'	6.18
'100'	5.82
'101'	5.45
'110'	5.08
'111'	4.00 (HRM)



## Forward link

Dial in any Arbitrary Capacity Operating Points (COP) or Average Data Rate

# 4GV-WB (RS1) Codec

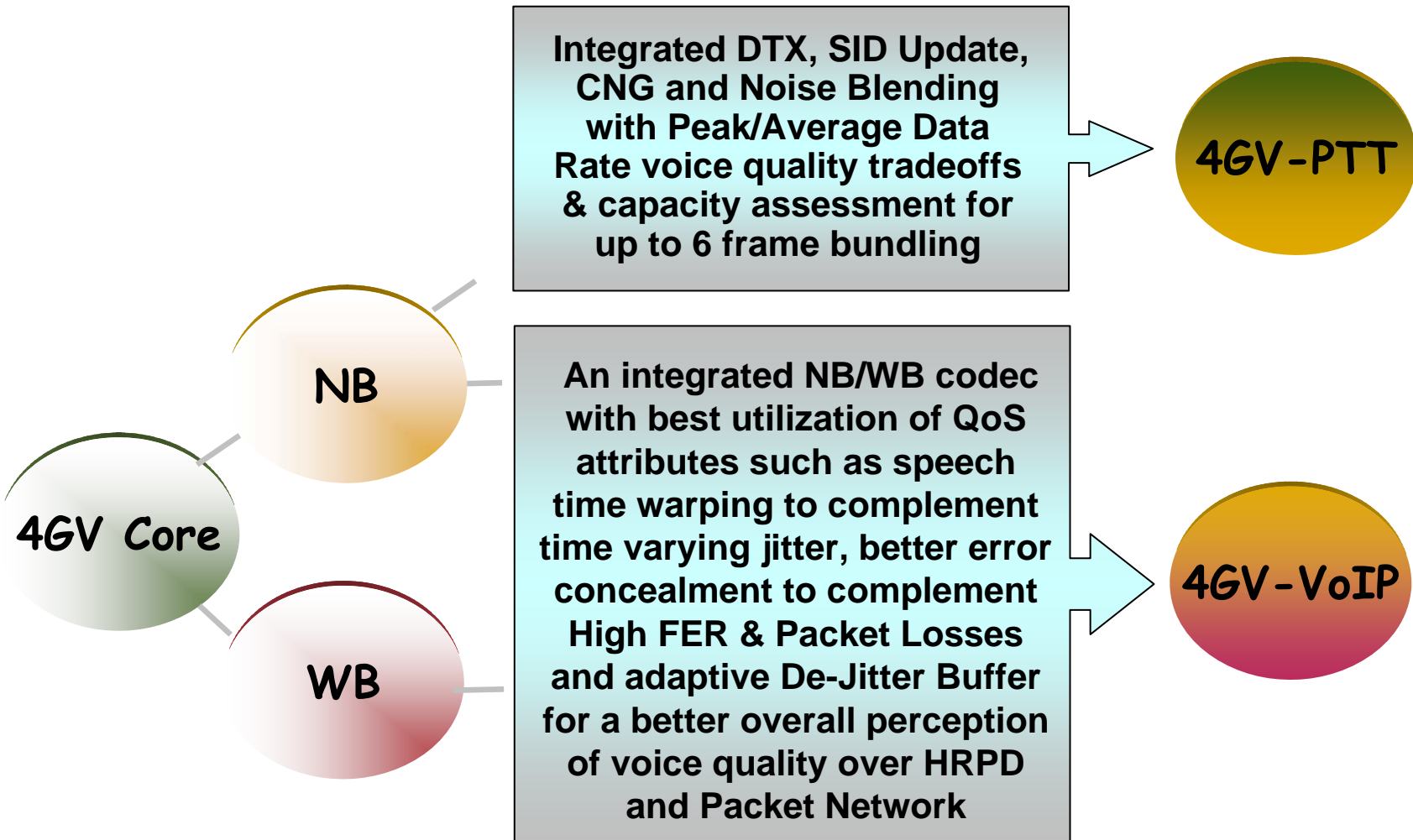


**Up to 40% reduction in Average Data Rate (ADR) as compared with EVRC**

**Same Average Data Rate (ADR) as EVRC**

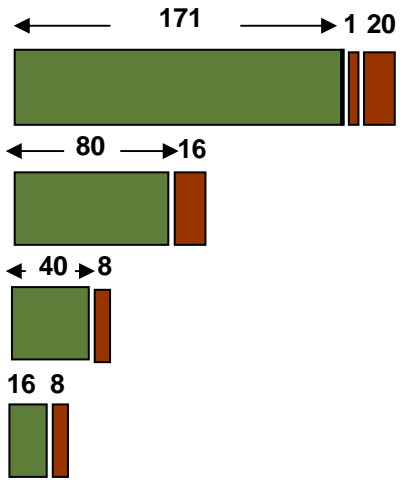


## 4GV PTT & VoIP Codecs

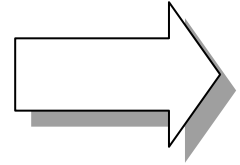
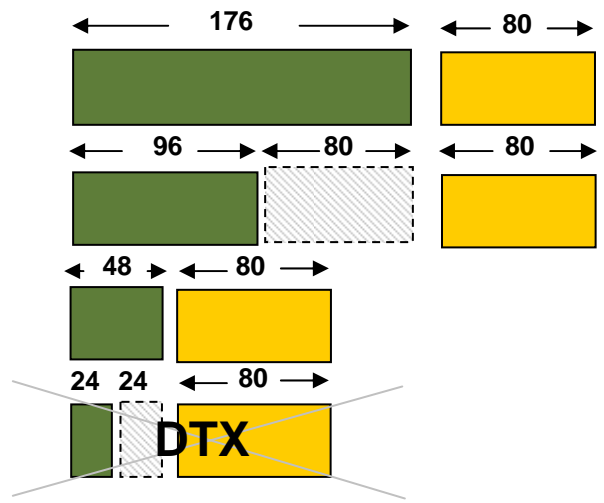


# Circuit Switched vs. Packet Switched

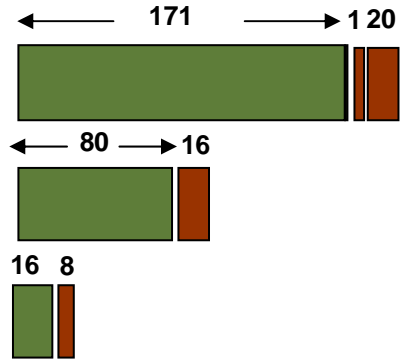
## CDMA2000-1x EVRC-B



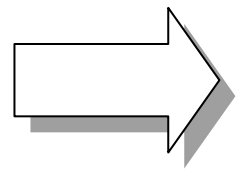
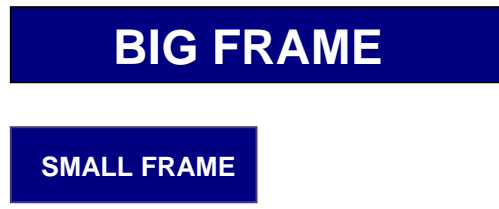
## HRPD-DOrA EVRCB



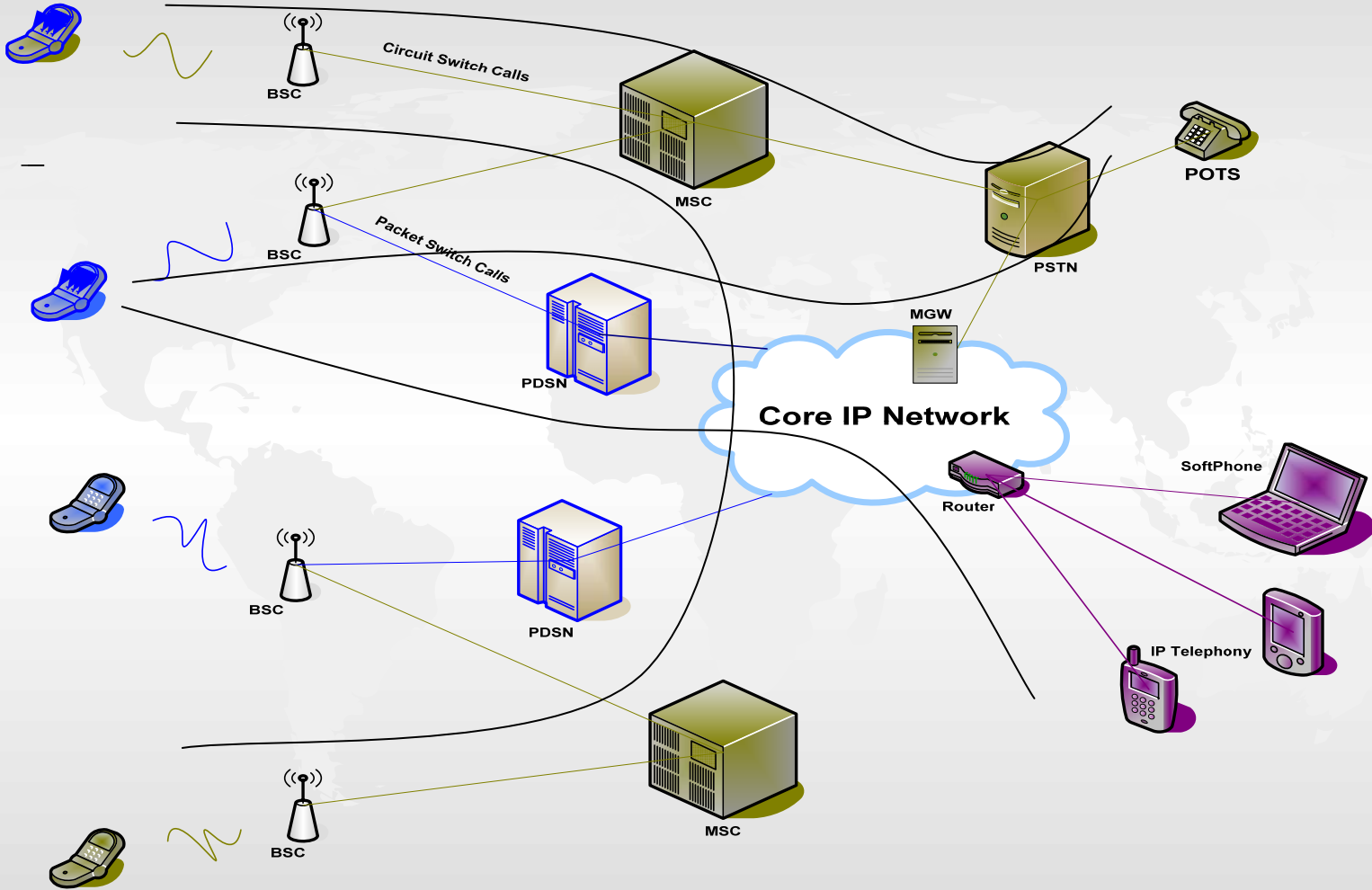
## CDMA2000-1x EVRC-WB



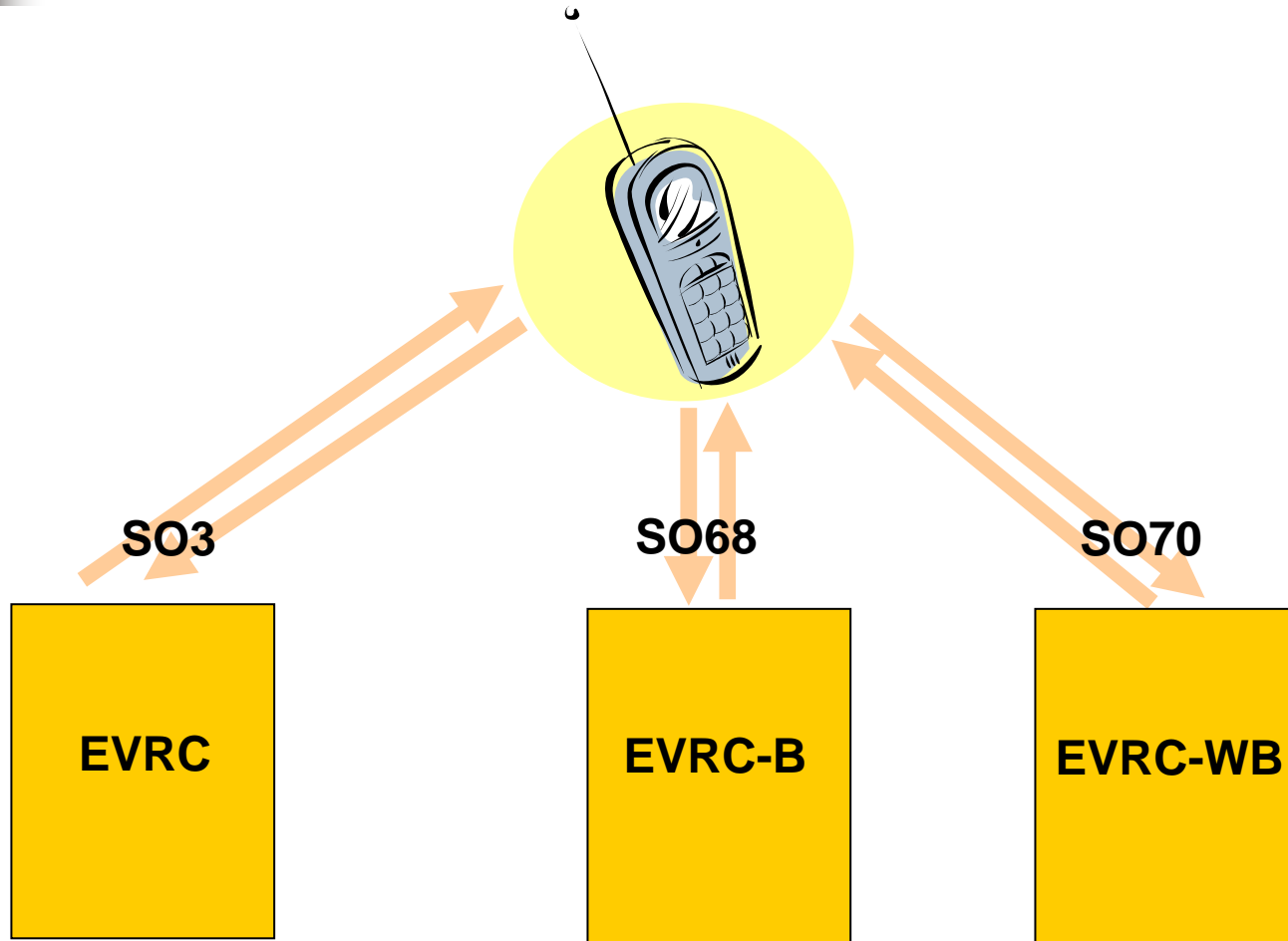
## HRPD-DOrA EVRCWB



# Hierarchical Network



# EVRC Family of Standard Codecs



# Standardization Status

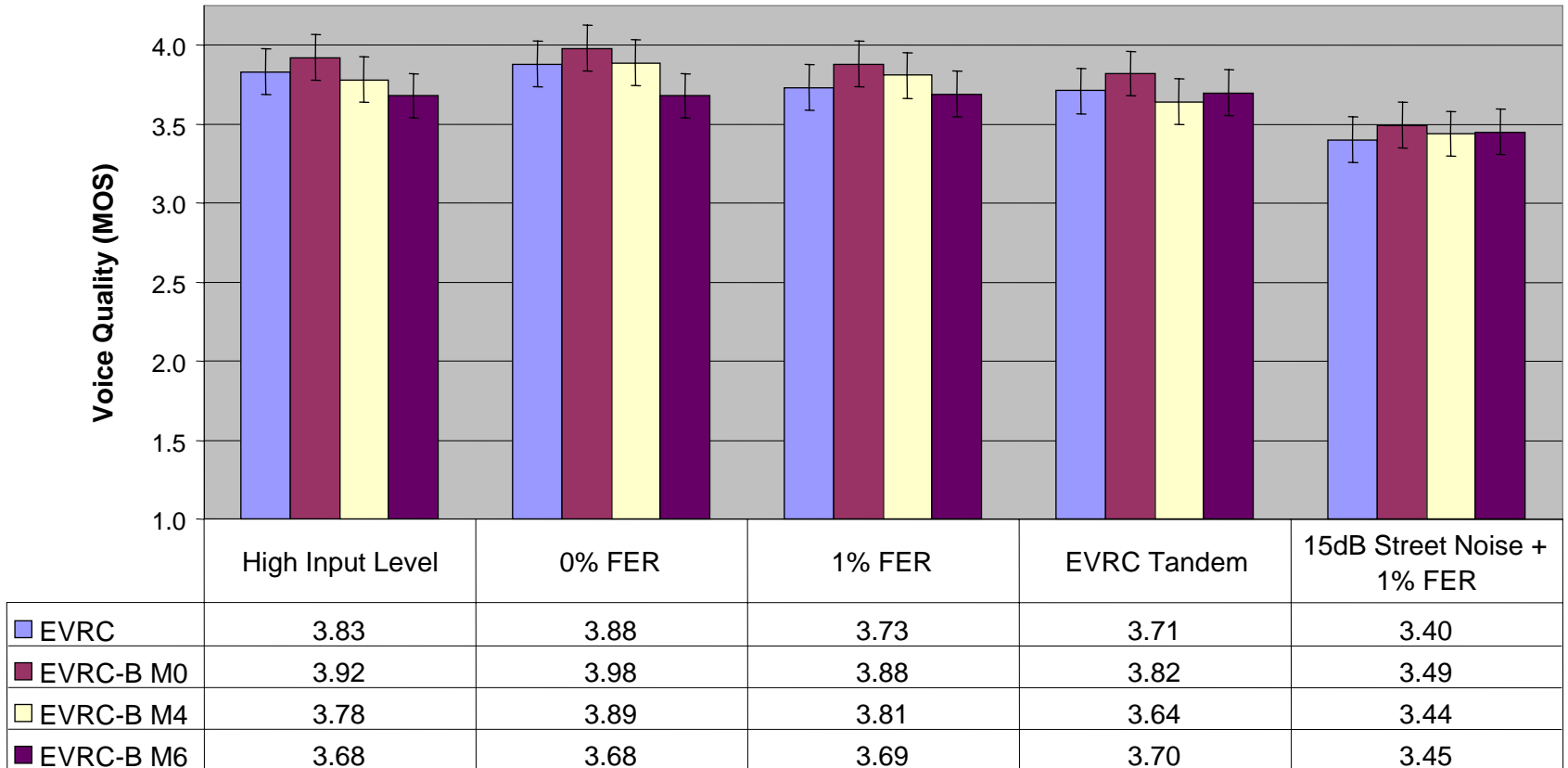
- **3GPP2**

- 4GV-NB as “EVRC-B” with SO68 well underway
  - WI supported by Bell Mobility, China Unicom, KDDI, Lucent, Motorola, Nortel, Qualcomm, SKT and Verizon
  - Baseline Text was approved in Dec’05 and to be published by April’06
  - Minimum Performance Specification and SW release by Jun’06
- 4GV-WB as “EVRC-WB” with SO70 is on-going
  - Work Item supported by China Unicom, Hitachi, KDDI, Lucent, Motorola, Nortel, Qualcomm, Samsung, SKT and Verizon
  - Specification submitted in Mar’06, baseline text by May’06 and target completion by 4Q’06

- **IETF**

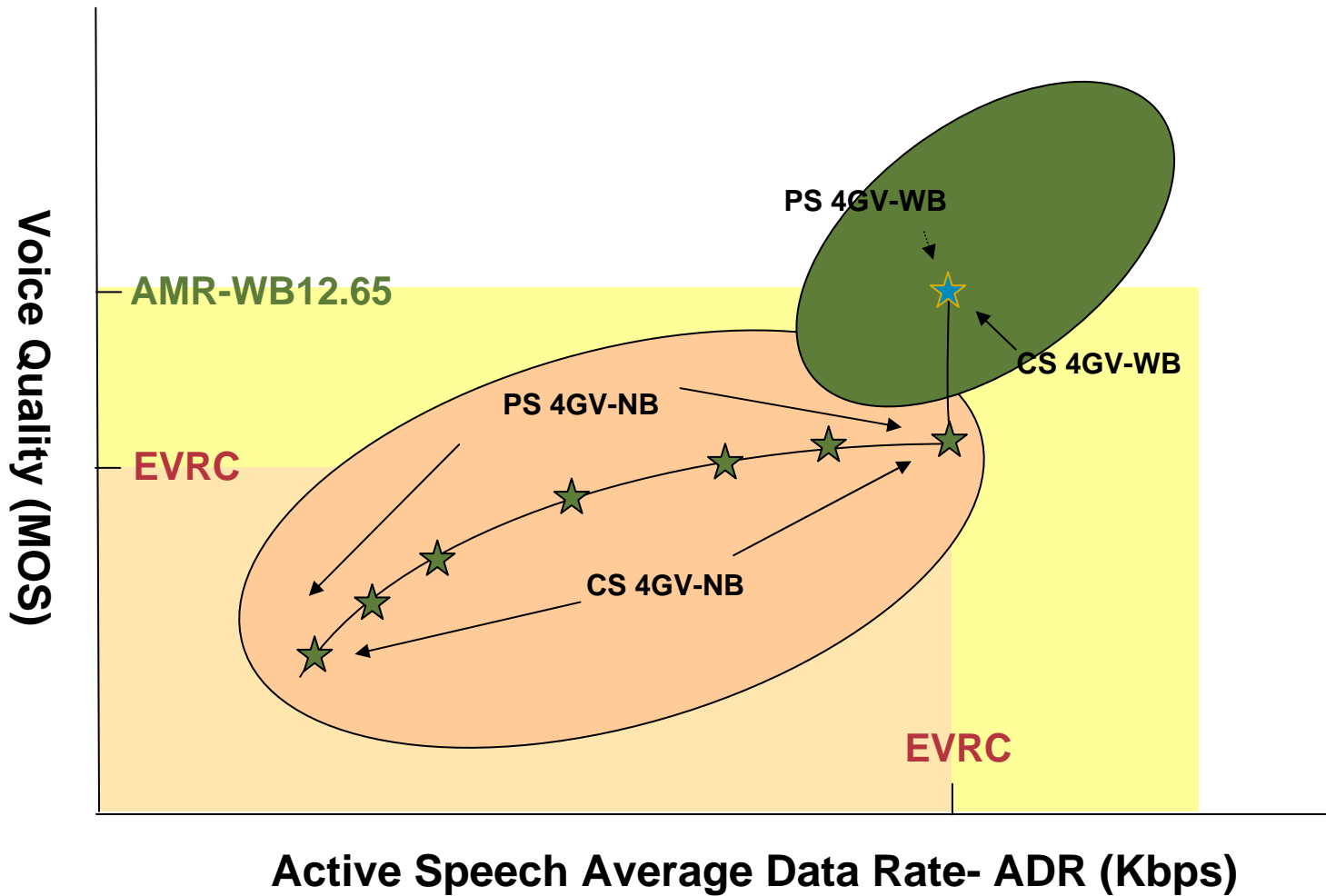
- EVRC-B RTP payload format submitted as RFC3558 draft extension and new “EVRCB” MIME-Type ( <http://www.ietf.org/internet-drafts/draft-ietf-avt-compact-bundled-evrc-02.txt> )
- EVRC-WB requires a new RFC3558 draft extension and new “EVRCWB” MIME-Type

# EVRC-B Characterization Test Results

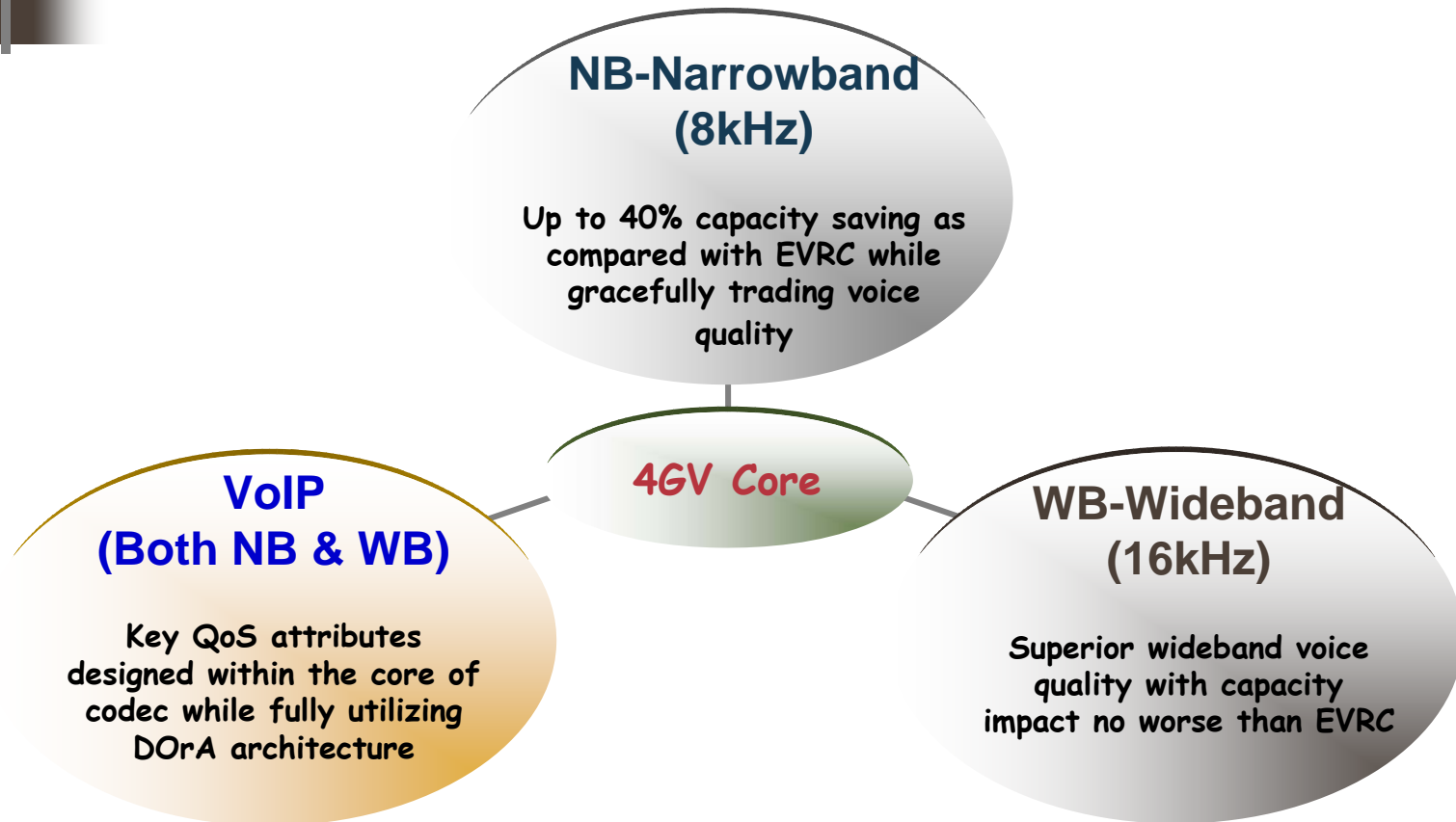


Source data from 3GPP2 C11-20060327-015, Dynastat EVRC-B Characterization Test Report

# 4GV Proposed Technology Roadmap



## 4GV in Summary



**An integrated solution based on a common core codec with an easy incremental software upgrade capability that simplifies the deployment while reducing the overall cost**





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**Thank You!**