

# Speech Coding Enhancement for Opus: Development Update

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draft-buethe-opus-speech-coding-enhancement

# Opus (SILK) Speech Coding Enhancement

## Algorithm Development

- Develop SOTA low-complexity speech coding enhancement methods
- First without side info, later with side info via extension mechanism
- Full optimization and integration into libopus

## Standardization

- Desirable to keep method open for improvement
- To achieve this: standardize requirements instead of methods regarding
  - Quality
  - Integration
  - Interoperability

# State as of IETF-119

## Algorithm Development

- LACE: very low complexity (100 MFLOPS) with significant quality improvement
- NoLACE: higher complexity (400 MFLOPS) higher quality gain
- Integration into libopus (1.5. release)

## Standardization

- First evaluation of quality metrics
- Identified modified opus compare metric as promising candidate for formulating requirements

# Opus 1.5 Integration

- Further size / complexity reduction of LACE/NoLACE
- compatible with all modes (silk/hybrid/celt/mono/stereo)
- compatible with neural PLC
- Resource requirements:

Method	Binary size (MB)	MFLOPS	MCPS on Cortex A-53	MCPS on Cortex A-72	MCPS on Cortex A-76
LACE	0.5	100	37.7	16.5	5.3
NoLACE	1.1	393	189.8	77.0	23.1

=> first complete implementation, prerequisite for continuing ID

# Questions regarding versioning and updates

- Since we don't standardize individual enhancement methods there might eventually be decoders with different enhancement methods deployed.
- Do we need a scheme for naming and versioning enhancement methods?
- Should the decoder disclose what method it will use?
- Should the encoder be given the capability to disable decoder enhancement or reject individual methods?

# Next steps

## **Algorithm Development**

- Improvements for bandwidths higher than wideband

## **Standardization**

- Formulate first proposal for quality requirements based on Opus 1.5

Thank you!