



Information on Evaluation of HM versus JM (JCTVC-D181)

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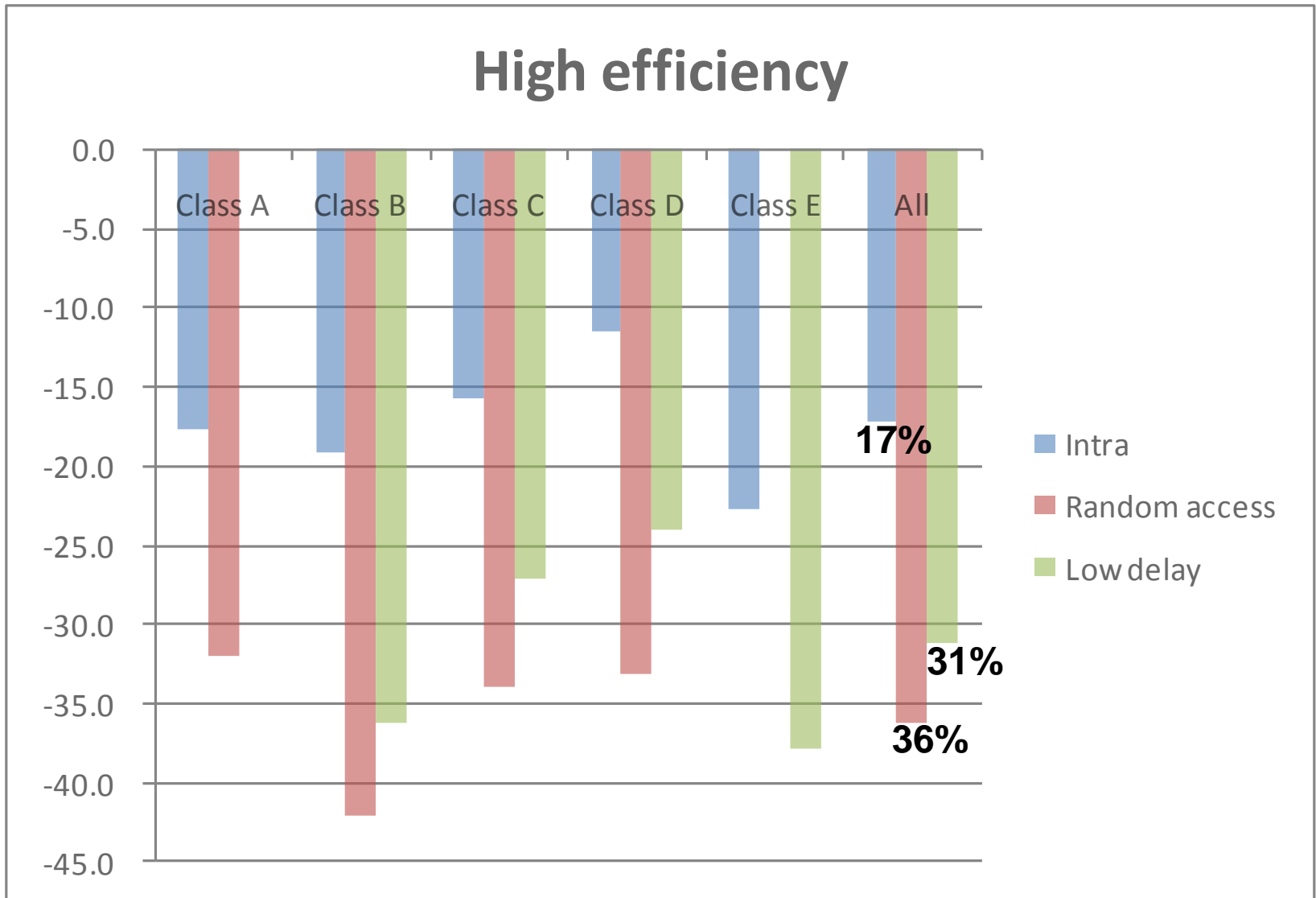
Introduction

- **HM established in the last meeting**
 - Extensive tool experiments (TE12)
 - Minimum set of well-tested tools included
- **Current status of HM**
 - Coding efficiency
 - Complexity
- **Evaluation of HM vs JM**
 - Comprehend the status of HM

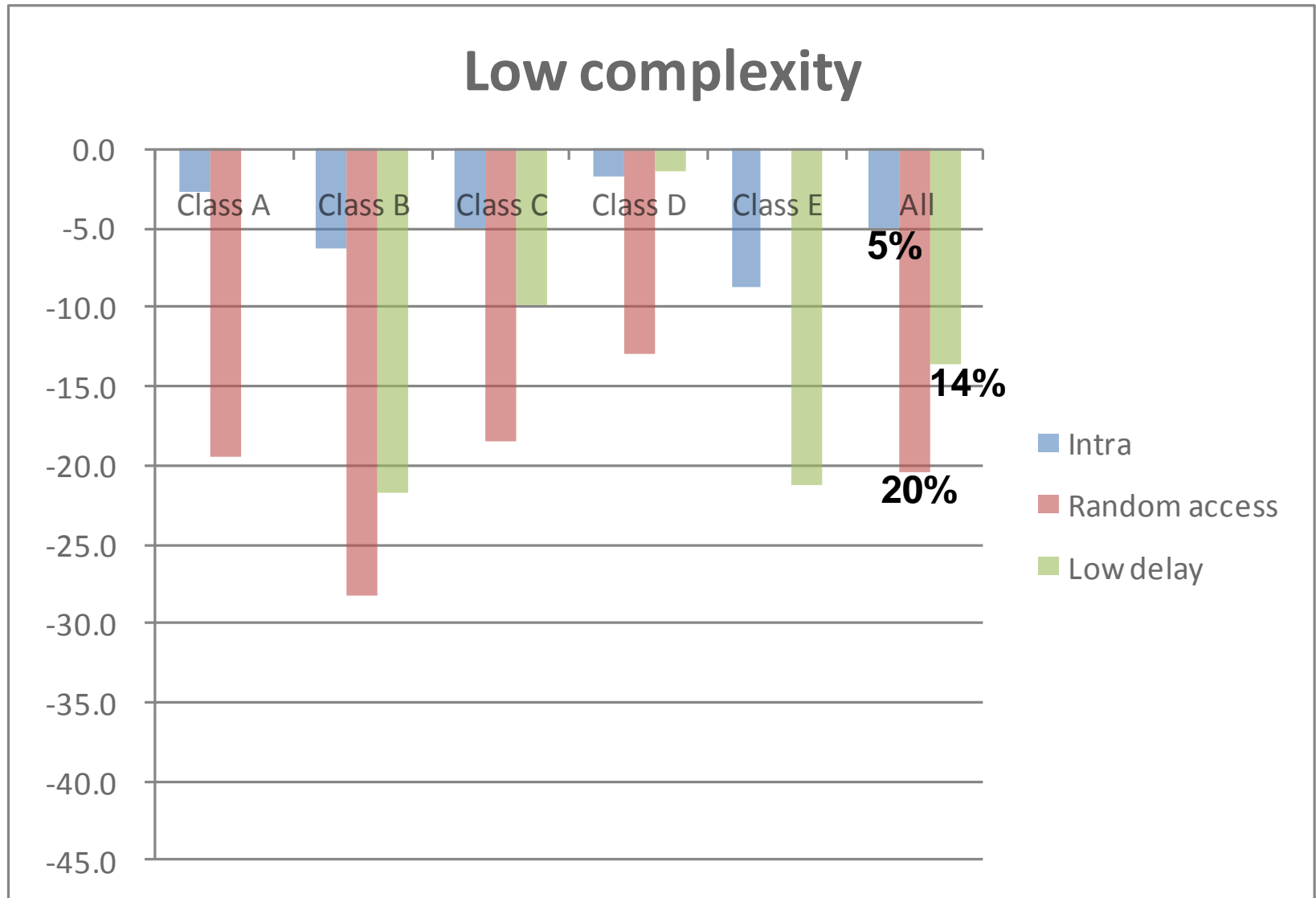
Test conditions

- **TMuC 0.9**
 - Intra, Intra LC, RAHE, RALC, LDHE, LDLC
- **Anchor**
 - JM 16.2
 - Alpha for RAHE & RALC
 - Beta with IPPP for LDHE & LDLC
 - Intra only (High profile)
- **Test platform**
 - Windows XP64
 - Intel i7 950 (3 GHz), 12G RAM

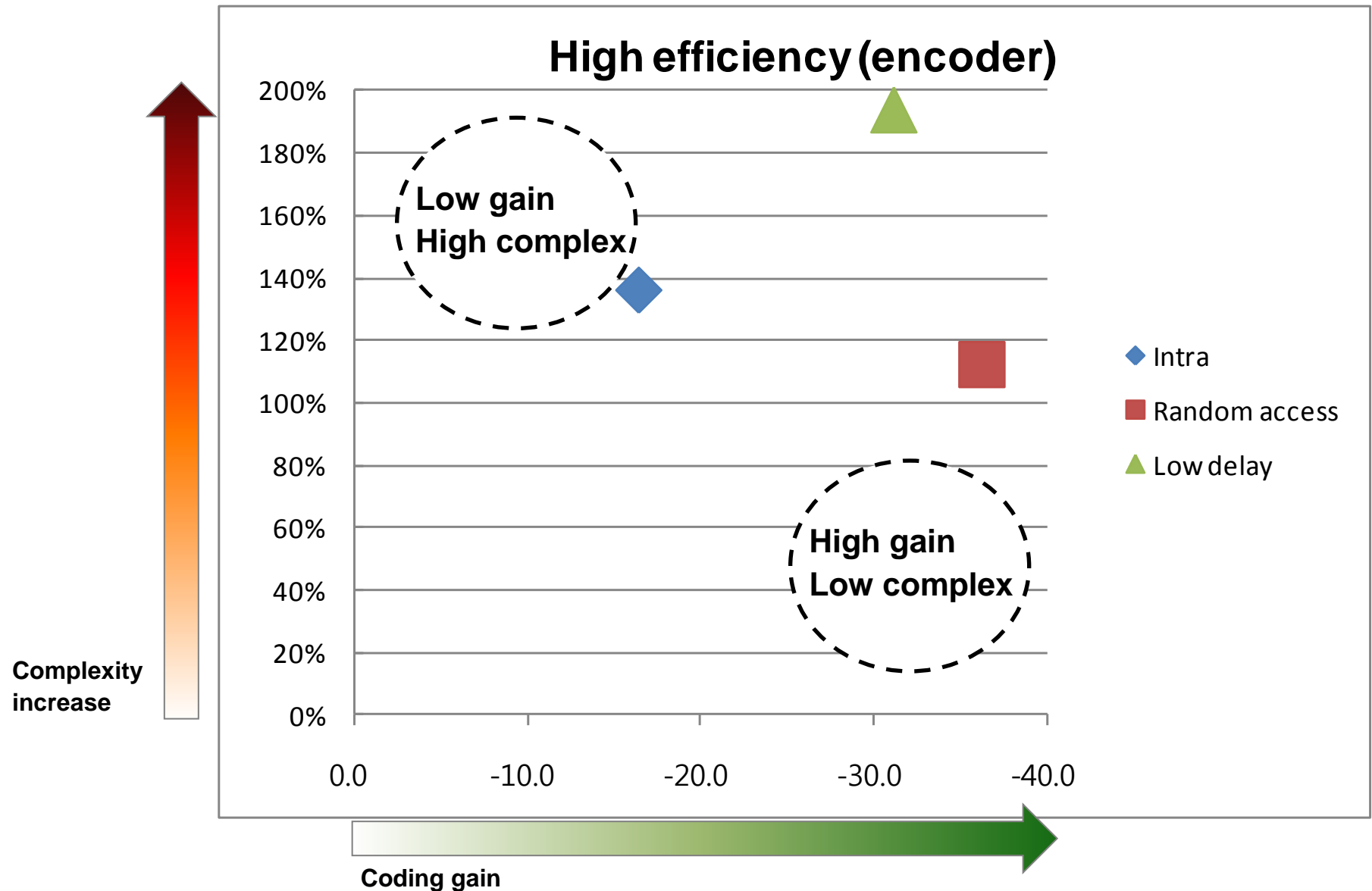
Testing results – coding efficiency



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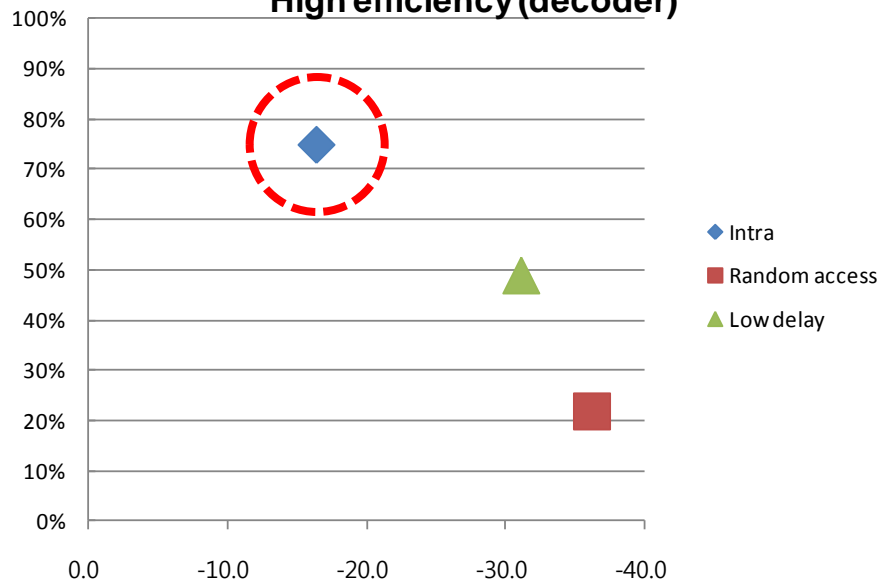


Testing results – BD rate with complexity

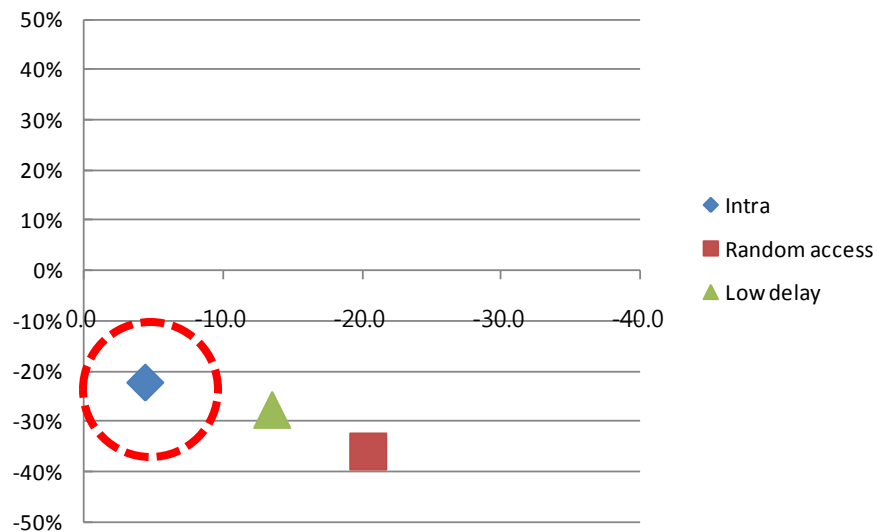


Testing results – BD rate with complexity

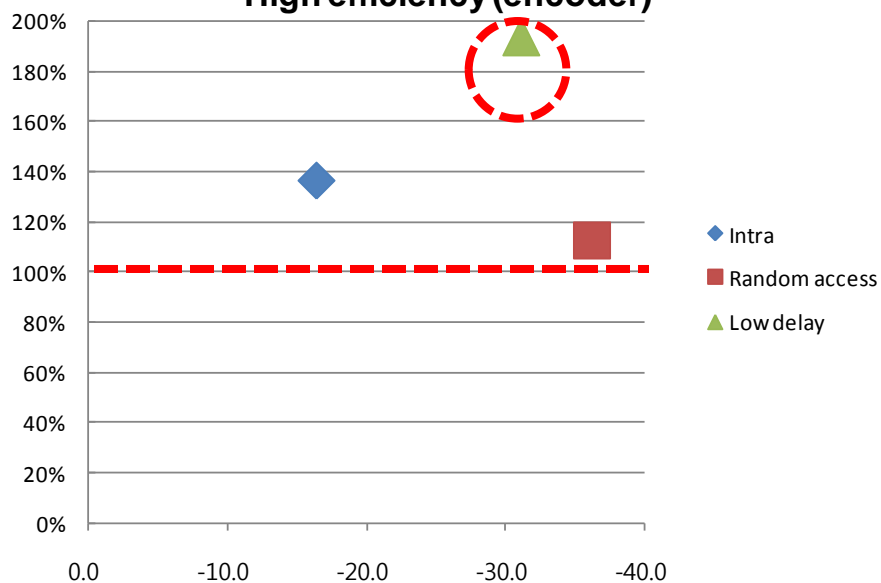
High efficiency (decoder)



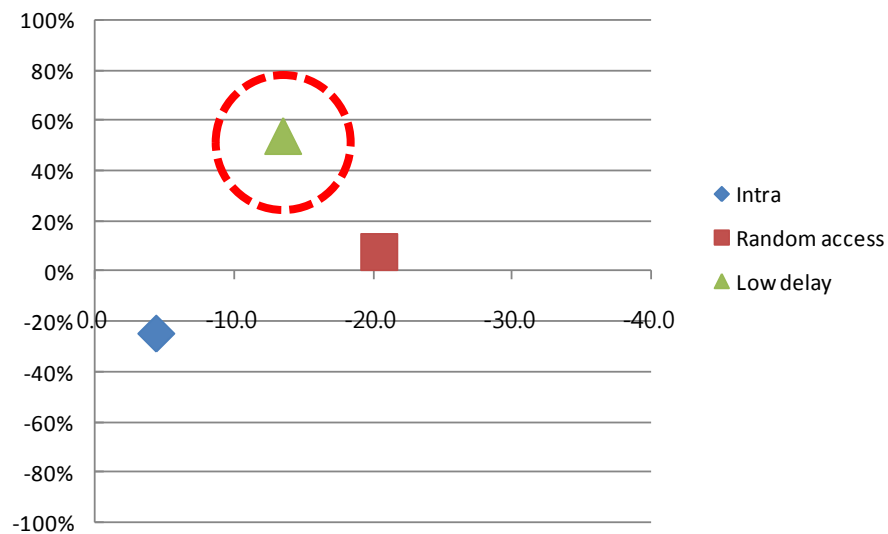
Low complexity (decoder)



High efficiency (encoder)



Low complexity (encoder)



Conclusion

- **Intra only configuration**
 - Relatively lower gain with high complexity than inter configurations
 - Should be more developed than inter coding tools in coding efficiency and complexity reduction
- **High complexity in encoder side**
 - Exceeded over 100% in all HE cases
 - Especially for low-delay case, about 200% and 50% complexity increase in HE and LC respectively
 - Should be more reduced than the current one

Table 1. BDrate with complexity


	Intra			Intra LoCo		
	Y BD-rate	U BD-rate	V BD-rate	Y BD-rate	U BD-rate	V BD-rate
Class A	-17.7	-12.1	-9.4	-2.6	-6.0	-3.4
Class B	-19.1	-16.8	-16.0	-6.3	-8.7	-7.8
Class C	-15.8	-14.5	-14.5	-5.0	-5.9	-4.1
Class D	-11.6	-10.6	-11.1	-1.7	-1.0	-0.3
Class E	-22.7	-14.2	-17.3	-8.7	-4.4	-8.5
All	-17.1	-14.0	-14.1	-5.0	-5.3	-4.9
Enc Time[%]	210%			67%		
Dec Time[%]	175%			78%		
	Random access			Random access LoCo		
	Y BD-rate	U BD-rate	V BD-rate	Y BD-rate	U BD-rate	V BD-rate
Class A	-32.1	-27.6	-28.0	-19.4	-20.4	-22.0
Class B	-42.1	-39.0	-39.0	-28.2	-28.3	-29.7
Class C	-34.0	-28.4	-28.9	-18.5	-19.5	-18.1
Class D	-33.1	-29.9	-30.1	-13.0	-18.5	-17.5
Class E						
All	-36.2	-32.2	-32.5	-20.4	-22.3	-22.3
Enc Time[%]	212%			108%		
Dec Time[%]	122%			64%		
	Low delay			Low delay LoCo		
	Y BD-rate	U BD-rate	V BD-rate	Y BD-rate	U BD-rate	V BD-rate
Class A						
Class B	-36.1	-9.2	-1.2	-21.7	-0.2	5.4
Class C	-27.2	-12.0	-11.1	-9.9	1.9	4.5
Class D	-24.0	-7.8	-8.2	-1.4	13.5	16.3
Class E	-37.8	-1.9	-5.1	-21.2	-11.1	-12.9
All	-31.2	-8.2	-6.1	-13.6	1.7	4.5
Enc Time[%]	293%			153%		
Dec Time[%]	149%			72%		

Alpha & Beta configuration

Alpha anchor

- Conformance with High Profile
- Hierarchical B pictures IbBbBbBbP (8) coding structure
 - Open GOP structuring
 - Intra period : 1 sec
 - max_ref_frames = 4
 - QP scaling: QP (I picture), QP+1 (P picture), QP+2 (first B layer), QP+3 (second B layer), QP+4 (third B layer)
- CABAC, 8x8 transforms enabled
- RD Optimization enabled / RDOQ enabled (fast mode, NUM=1)
- Adaptive rounding disabled / Weighted prediction enabled
- Fast motion estimation (range 128x128)

Beta anchor (satisfies constraint set 2)

- Conformance with High Profile
- I frame as the first picture)
- Hierarchical P pictures IpPp  **Changed to IPPP**
 - QP scaling: QP (I picture), QP+1 (first P layer), QP+4 (second P layer), QP+5 (third P layer)
 - max_ref_frames = 4
- CABAC, 8x8 transforms enabled
- RD Optimization enabled / RDOQ enabled (fast mode, NUM=1)
- Adaptive rounding disabled / Weighted prediction enabled
- Fast motion estimation. (range 128x128)