

Efficiency

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Version: V1.0(20121029)

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Assumptions

- **Theoretical analysis based on the following assumptions:**

Number of Users	32	
LCD Margin	6	dB
Multi MSC Margin	4	dB
RF Spectrum	192	MHz
Usable RF Spectrum	62.5	%
Used RF Spectrum	120	MHz
Number of MCS*	3	
FEC Gain	6	dB

* Static provisioning for multi-MSC network

Bit Loading Options

QAM Level	Bit Loading (bit/Hz)	Operating SNR (dB)
QAM 256	8	25.5
QAM 1024	10	31.5
QAM 4096	12	36

User Profiles

- **Created 4 User Sets**

User Set 1 Based on slide 4/5 of varanese_01 from Geneva meeting:

~30% QAM4096

~70% QAM1024

User Set 2 Based on slide 10/11 of varanese_01 from Geneva meeting:

~48% QAM4096

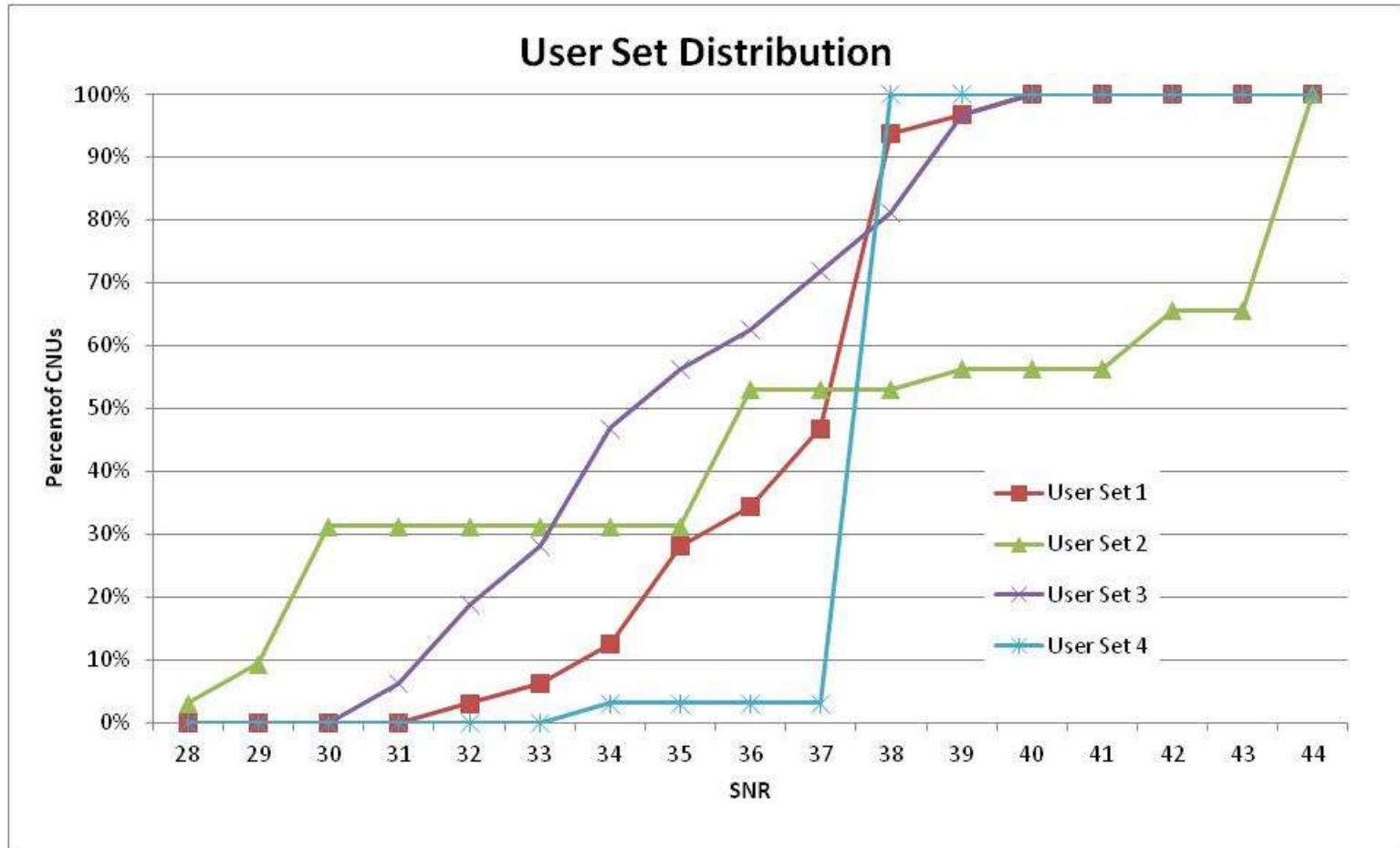
~20% QAM1024

~32% QAM256

User Set 3 Random distribution between 31 and 40 dB

User Set 4 Homogeneous network at 38 dB with 1 outlier 4 dB down.

User Sets



Efficiency Improvement

User Set	Line Rate		Eff Improvement
	LCD	Multi-MCS	
1	960	1193	24%
2	720	1230	71%
3 ¹	960	1118	16%
4 ²	960	1200 (1193)	25% (24%)

- 1) varies with calculation iteration
- 2) Numbers in parenthesis for 32 users at 36.5 and 1.4 dB down

Line Rate calculation

- For LDC == min. achievable rate (after margin) for all users in the set
- For Multi-MCS == avg. achievable rate (after margin) for all users in the set

$$\text{Eff Improvement} = (\text{Multi-MCS}_{(LR)} - \text{LCD}_{(LR)}) / \text{LCD}_{(LR)}$$

Conclusion

- **Using multiple profiles will always yield a data capacity improvement when compared to a single profile.**

Thank you

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Extracts from varanese_01a_0912.pdf

