XML Analysis Template

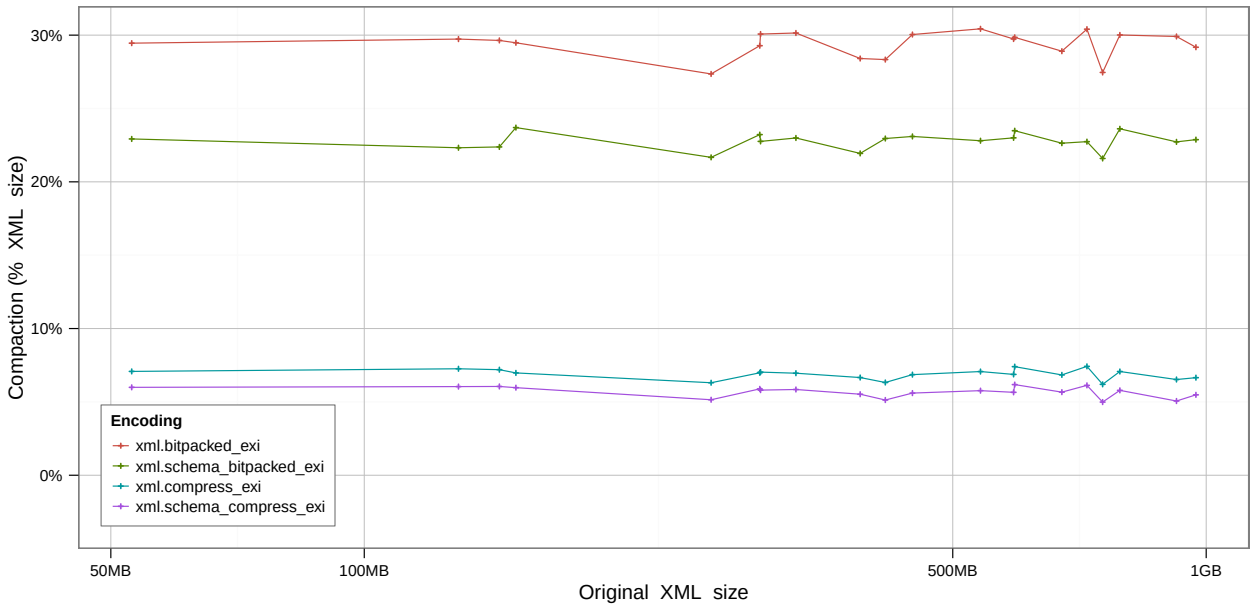
23 January, 2015

Results for OpenStreetMap Use Case

EXI Exploratory

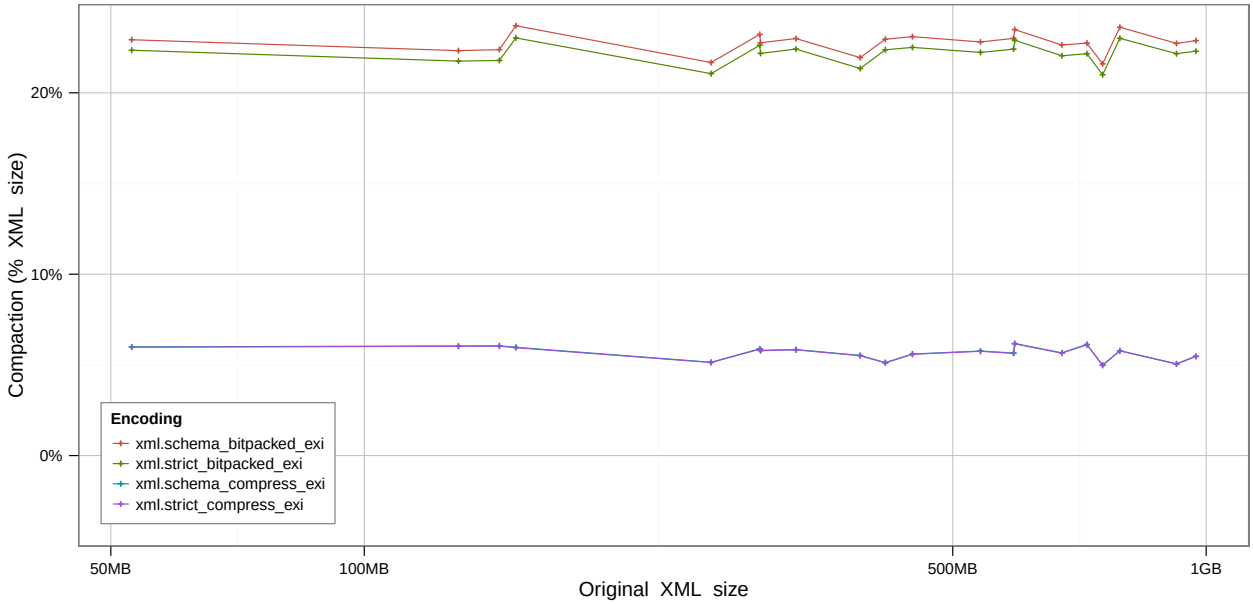
A. How do the primary EXI modes compare for schemaless & schema-informed encodings?

```
## [1] "Series:   xml.bitpacked_exi, xml.schema_bitpacked_exi, xml.compress_exi, xml.schema_compress_exi"
## [1] "Baseline:  xml"
##  xml.bitpacked_exi xml.schema_bitpacked_exi xml.compress_exi
##  Min.   :0.2736    Min.   :0.2159           Min.   :0.06196
##  1st Qu.:0.2911    1st Qu.:0.2257           1st Qu.:0.06658
##  Median :0.2969    Median :0.2284           Median :0.06964
##  Mean   :0.2939    Mean   :0.2277           Mean   :0.06883
##  3rd Qu.:0.3002    3rd Qu.:0.2302           3rd Qu.:0.07072
##  Max.   :0.3043    Max.   :0.2370           Max.   :0.07421
##  xml.schema_compress_exi
##  Min.   :0.04988
##  1st Qu.:0.05512
##  Median :0.05775
##  Mean   :0.05684
##  3rd Qu.:0.05974
##  Max.   :0.06179
```



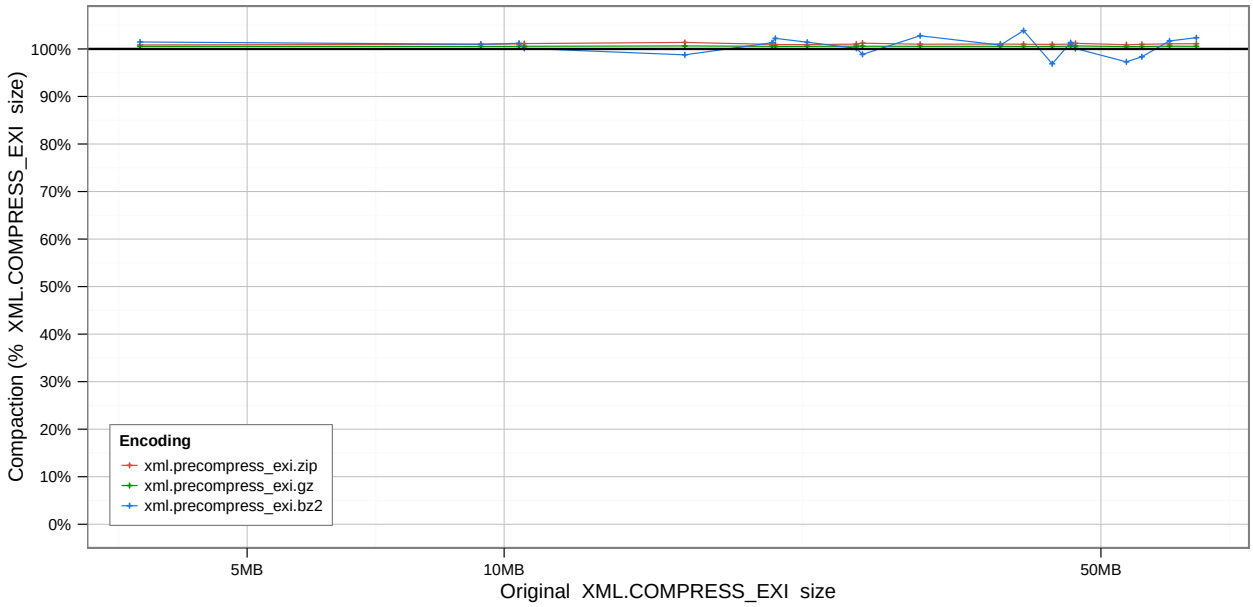
B. Does the 'strict' option significantly improve compaction for schema-informed encodings?

```
## [1] "Series:   xml.schema_bitpacked_exi, xml.strict_bitpacked_exi, xml.schema_compress_exi, xml.stric
## [1] "Baseline:  xml"
##  xml.schema_bitpacked_exi xml.strict_bitpacked_exi xml.schema_compress_exi
##  Min.   :0.2159           Min.   :0.2100           Min.   :0.04988
##  1st Qu.:0.2257           1st Qu.:0.2198           1st Qu.:0.05512
##  Median :0.2284           Median :0.2226           Median :0.05775
##  Mean   :0.2277           Mean   :0.2218           Mean   :0.05684
##  3rd Qu.:0.2302           3rd Qu.:0.2243           3rd Qu.:0.05974
##  Max.   :0.2370           Max.   :0.2302           Max.   :0.06179
##  xml.strict_compress_exi
##  Min.   :0.04974
##  1st Qu.:0.05494
##  Median :0.05760
##  Mean   :0.05667
##  3rd Qu.:0.05955
##  Max.   :0.06161
```



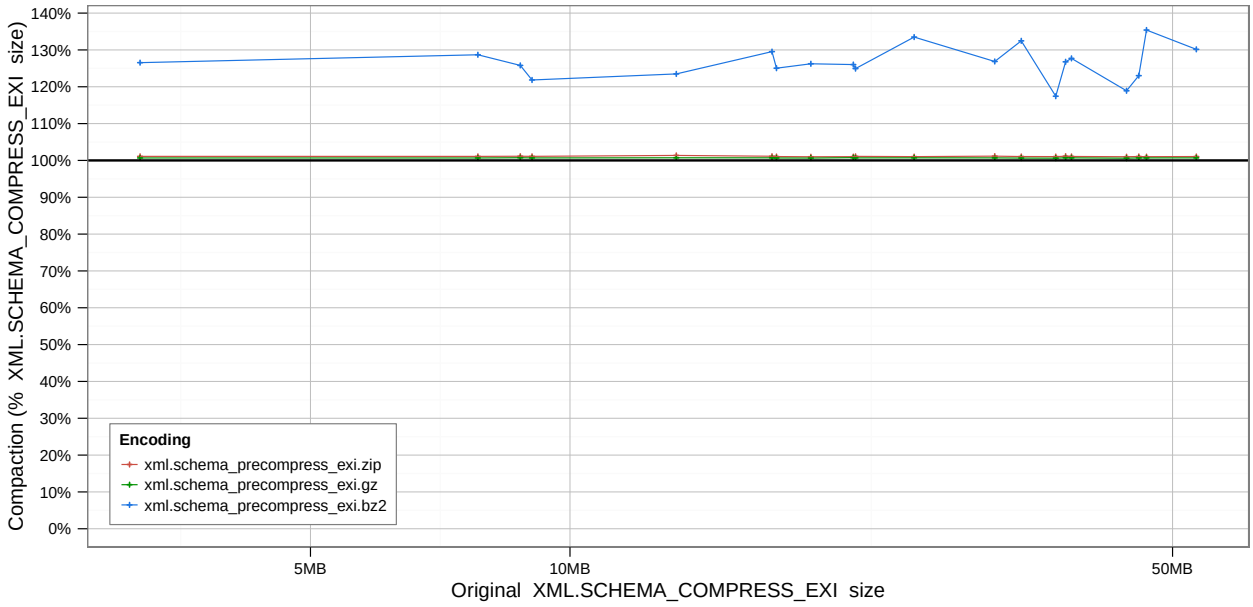
C. Do any of the tested conventional compression algorithms perform better on a schemaless, precompress EXI document than the standard DEFLATE?

```
## [1] "Series:   xml.precompress_exi.zip, xml.precompress_exi.gz, xml.precompress_exi.bz2"
## [1] "Baseline:  xml.compress_exi"
##  xml.precompress_exi.zip xml.precompress_exi.gz xml.precompress_exi.bz2
##  Min.   :1.009           Min.   :1.005          Min.   :0.9688
##  1st Qu.:1.010           1st Qu.:1.005          1st Qu.:0.9978
##  Median :1.010           Median :1.006          Median :1.0109
##  Mean   :1.010           Mean   :1.006          Mean   :1.0060
##  3rd Qu.:1.011           3rd Qu.:1.006          3rd Qu.:1.0152
##  Max.   :1.014           Max.   :1.006          Max.   :1.0386
```



D. Do any of the tested conventional compression algorithms perform better on a schema-informed, precompress EXI document than the standard DEFLATE?

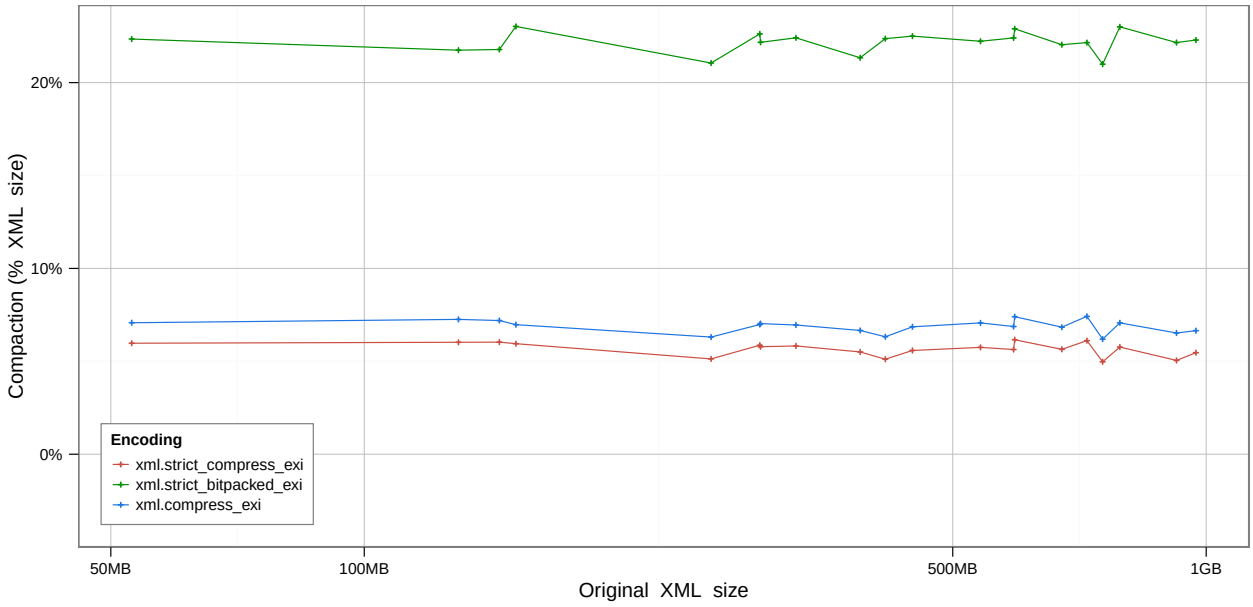
```
## [1] "Series:   xml.schema_precompress_exi.zip, xml.schema_precompress_exi.gz, xml.schema_precompress
## [1] "Baseline:  xml.schema_compress_exi"
##  xml.schema_precompress_exi.zip xml.schema_precompress_exi.gz
##  Min.   :1.010                  Min.   :1.006
##  1st Qu.:1.010                  1st Qu.:1.007
##  Median :1.011                  Median :1.007
##  Mean   :1.011                  Mean   :1.007
##  3rd Qu.:1.011                  3rd Qu.:1.007
##  Max.   :1.014                  Max.   :1.008
##  xml.schema_precompress_exi.bz2
##  Min.   :1.174
##  1st Qu.:1.246
##  Median :1.264
##  Mean   :1.265
##  3rd Qu.:1.289
##  Max.   :1.354
```



Binary-comparisons

E. Which EXI encoding is the most compact?

```
## [1] "Series:   xml.strict_compress_exi, xml.strict_bitpacked_exi, xml.compress_exi"
## [1] "Baseline:  xml"
##  xml.strict_compress_exi xml.strict_bitpacked_exi xml.compress_exi
##  Min.   :0.04974         Min.   :0.2100           Min.   :0.06196
##  1st Qu.:0.05494         1st Qu.:0.2198           1st Qu.:0.06658
##  Median :0.05760         Median :0.2226           Median :0.06964
##  Mean   :0.05667         Mean   :0.2218           Mean   :0.06883
##  3rd Qu.:0.05955         3rd Qu.:0.2243           3rd Qu.:0.07072
##  Max.   :0.06161         Max.   :0.2302           Max.   :0.07421
```



F. For a network already using gzip, do any of the EXI encodings offer improvements?

```
## [1] "Series:   xml.strict_compress_exi, xml.strict_bitpacked_exi, xml.compress_exi"
## [1] "Baseline:  xml.gz"
##  xml.strict_compress_exi xml.strict_bitpacked_exi xml.compress_exi
##  Min.   :0.5898          Min.   :2.217            Min.   :0.7246
##  1st Qu.:0.6034          1st Qu.:2.333            1st Qu.:0.7358
##  Median :0.6128          Median :2.386            Median :0.7399
##  Mean   :0.6103          Mean   :2.394            Mean   :0.7418
##  3rd Qu.:0.6170          3rd Qu.:2.458            3rd Qu.:0.7469
##  Max.   :0.6278          Max.   :2.609            Max.   :0.7623
```