

XML Analysis Template

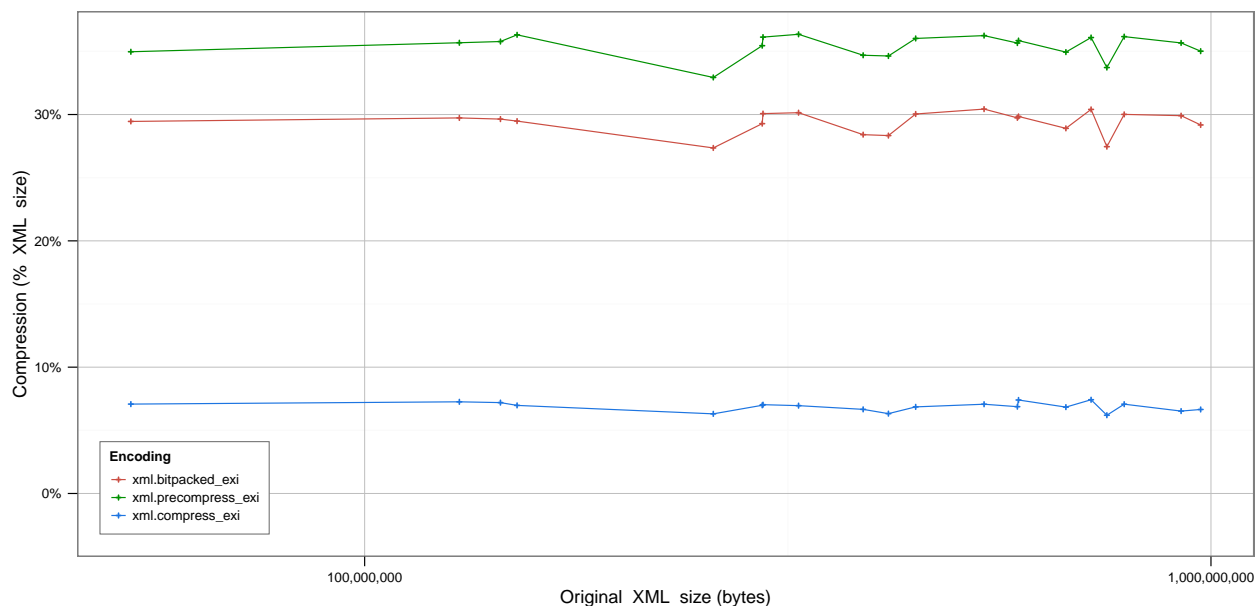
15 January, 2015

Results for OpenStreetMap Use Case

EXI Exploratory

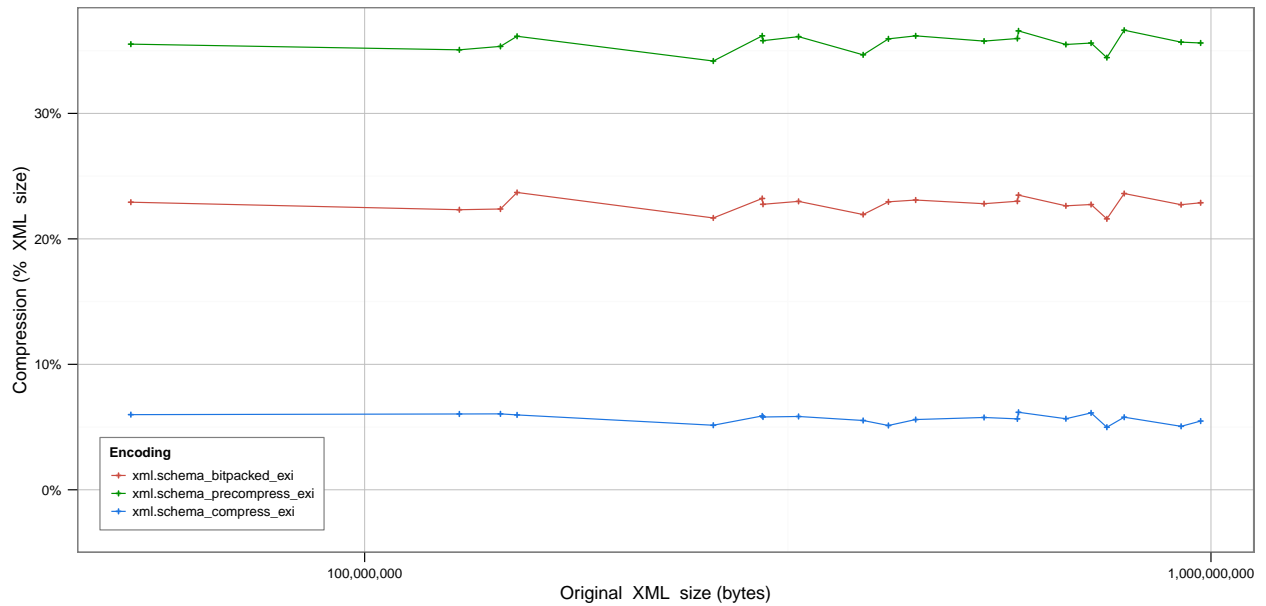
A. How do the primary EXI modes compare for schemaless encodings?

```
## [1] "Series:  xml.bitpacked_exi, xml.precompress_exi, xml.compress_exi"
## [1] "Baseline:  xml"
## xml.bitpacked_exi xml.precompress_exi xml.compress_exi
## Min.   :0.2736    Min.   :0.3294    Min.   :0.06196
## 1st Qu.:0.2911    1st Qu.:0.3496    1st Qu.:0.06658
## Median :0.2969    Median :0.3568    Median :0.06964
## Mean   :0.2939    Mean   :0.3542    Mean   :0.06883
## 3rd Qu.:0.3002    3rd Qu.:0.3610    3rd Qu.:0.07072
## Max.   :0.3043    Max.   :0.3635    Max.   :0.07421
```



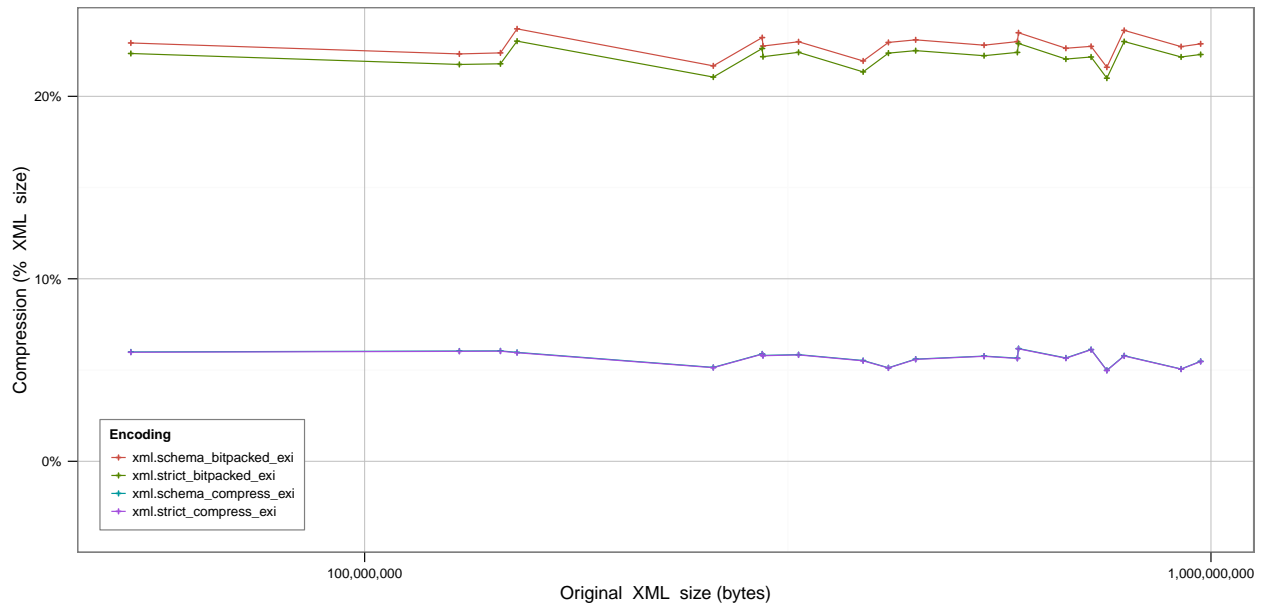
B. How do the primary EXI 'modes' compare for schema-informed encodings?

```
## [1] "Series:  xml.schema_bitpacked_exi, xml.schema_precompress_exi, xml.schema_compress_exi"
## [1] "Baseline:  xml"
## xml.schema_bitpacked_exi xml.schema_precompress_exi
## Min.      :0.2159          Min.      :0.3417
## 1st Qu.:0.2257          1st Qu.:0.3546
## Median :0.2284          Median :0.3572
## Mean     :0.2277          Mean     :0.3565
## 3rd Qu.:0.2302          3rd Qu.:0.3613
## Max.     :0.2370          Max.     :0.3663
## xml.schema_compress_exi
## Min.      :0.04988
## 1st Qu.:0.05512
## Median :0.05775
## Mean     :0.05684
## 3rd Qu.:0.05974
## Max.     :0.06179
```



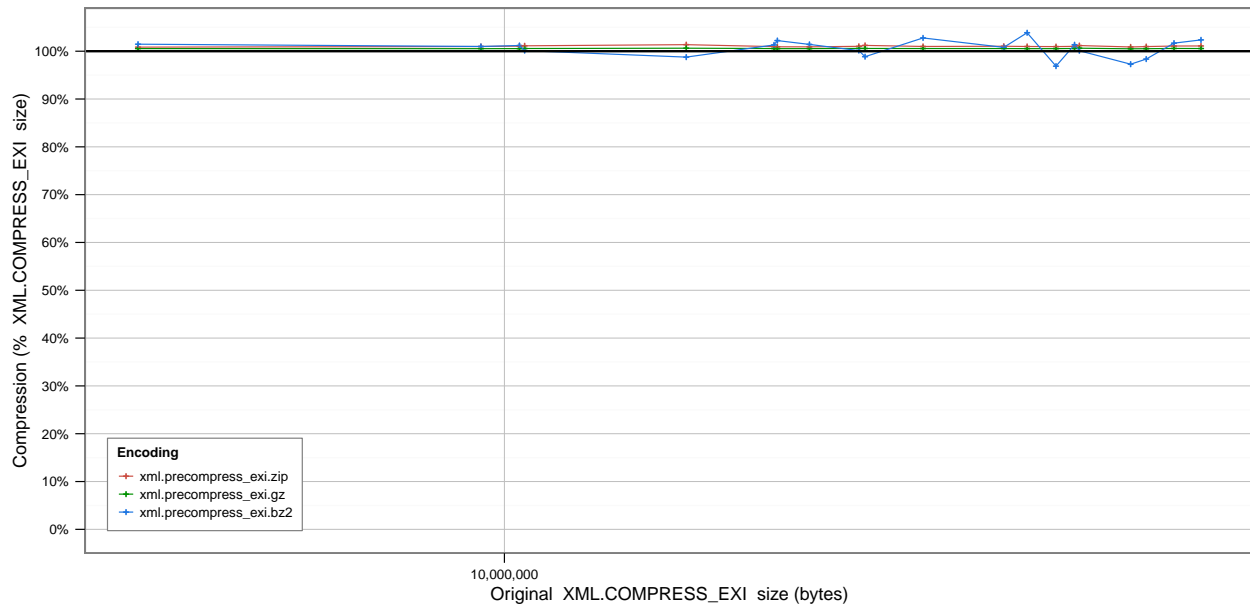
C. Does the 'strict' option significantly improve compaction for schema-informed encodings?

```
## [1] "Series:  xml.schema_bitpacked_exl, xml.strict_bitpacked_exl, xml.schema_compress_exl, xml.strict_compress_exl"
## [1] "Baseline:  xml"
## xml.schema_bitpacked_exl xml.strict_bitpacked_exl xml.schema_compress_exl
## 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_exl
## Min.      :0.04974
## 1st Qu.:0.05494
## Median :0.05760
## Mean    :0.05667
## 3rd Qu.:0.05955
## Max.    :0.06161
```



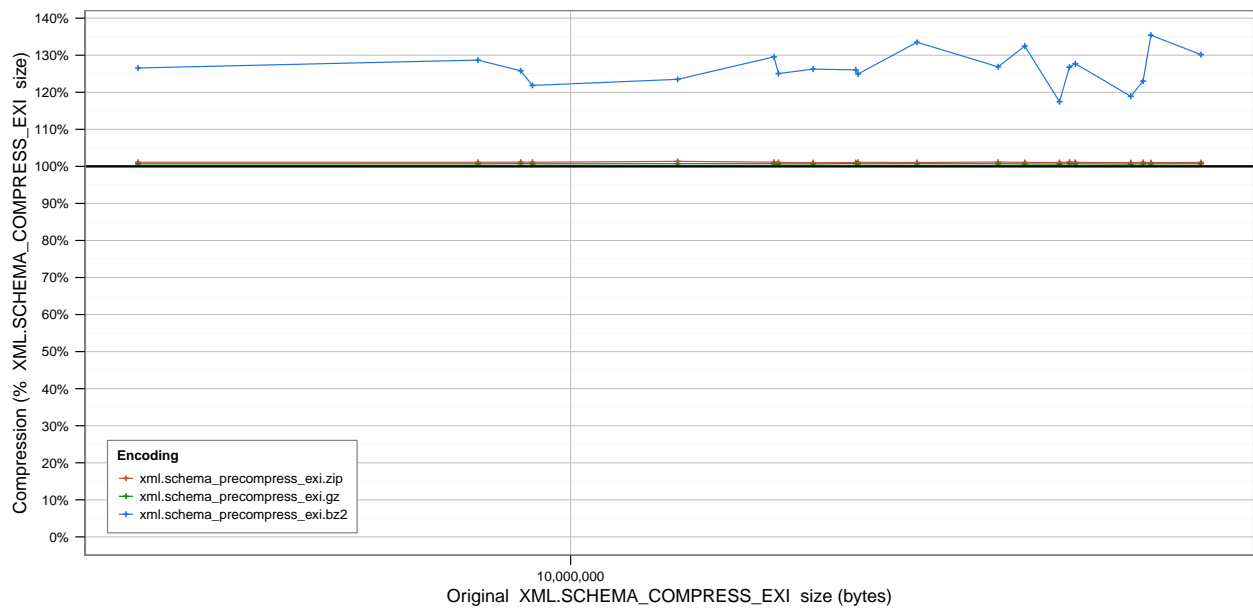
D. Do any of the tested compression algorithms perform better on a schemaless, precompress EXI document than the standard DEFLATE?

```
## [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
```



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

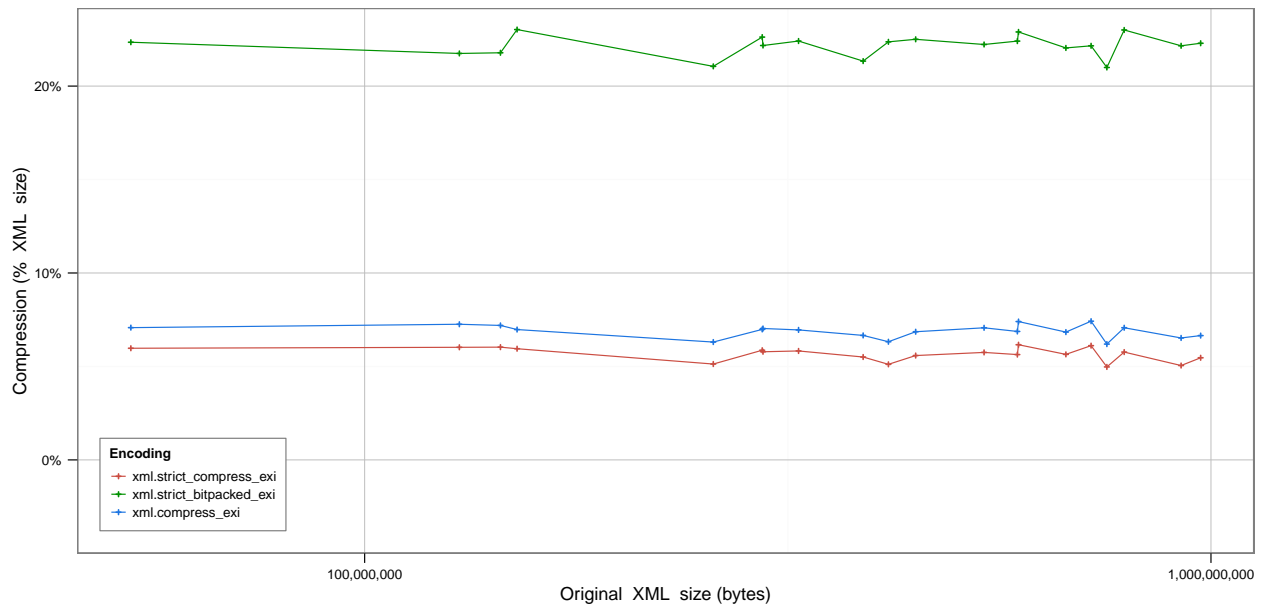
```
## [1] "Series:  xml.schema_precompress_exi.zip, xml.schema_precompress_exi.gz, xml.schema_precompress_exi.bz2"
## [1] "Baseline:  xml.schema_compress_exi"
##  xml.schema_precompress_exi.zip  xml.schema_precompress_exi.gz
##  Min.      :1.010                Min.      :1.006
##  1st Qu.:1.010                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

F. 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
```



G. 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
```

