

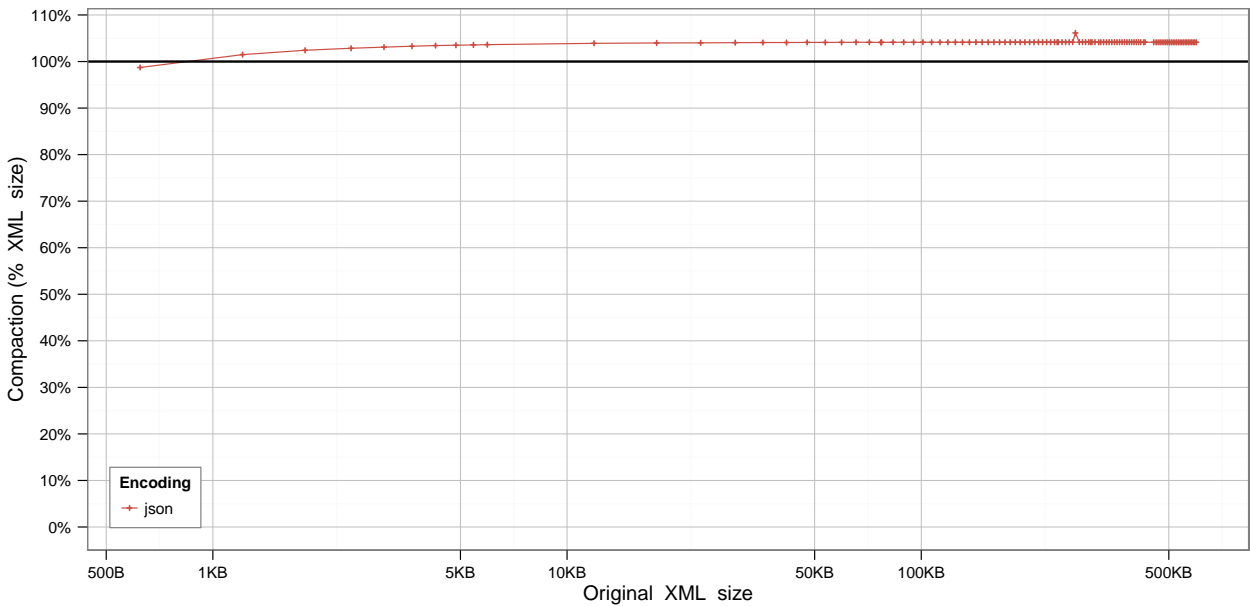
XML/JSON Analysis Template

Results for OpenWeatherMap Use Case

Plaintext Comparisons

A. How do JSON and XML compare when plaintext-encoded?

```
## [1] "Series:  json"
## [1] "Baseline: xml"
##      json
##  Min.   :0.9872
## 1st Qu.:1.0413
## Median :1.0414
## Mean   :1.0401
## 3rd Qu.:1.0416
## Max.   :1.0615
```

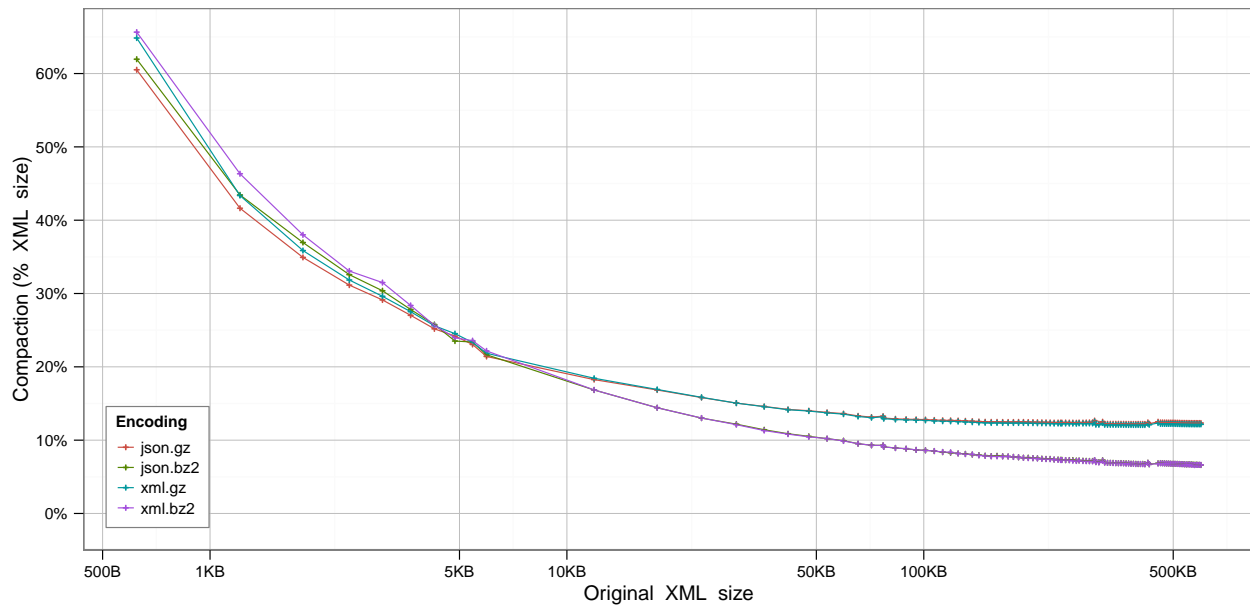


B. How do JSON and XML compare when compressed with conventional compression algorithms?

```
## [1] "Series:  json.gz, json.bz2, xml.gz, xml.bz2"
```

```
## [1] "Baseline:  xml"
```

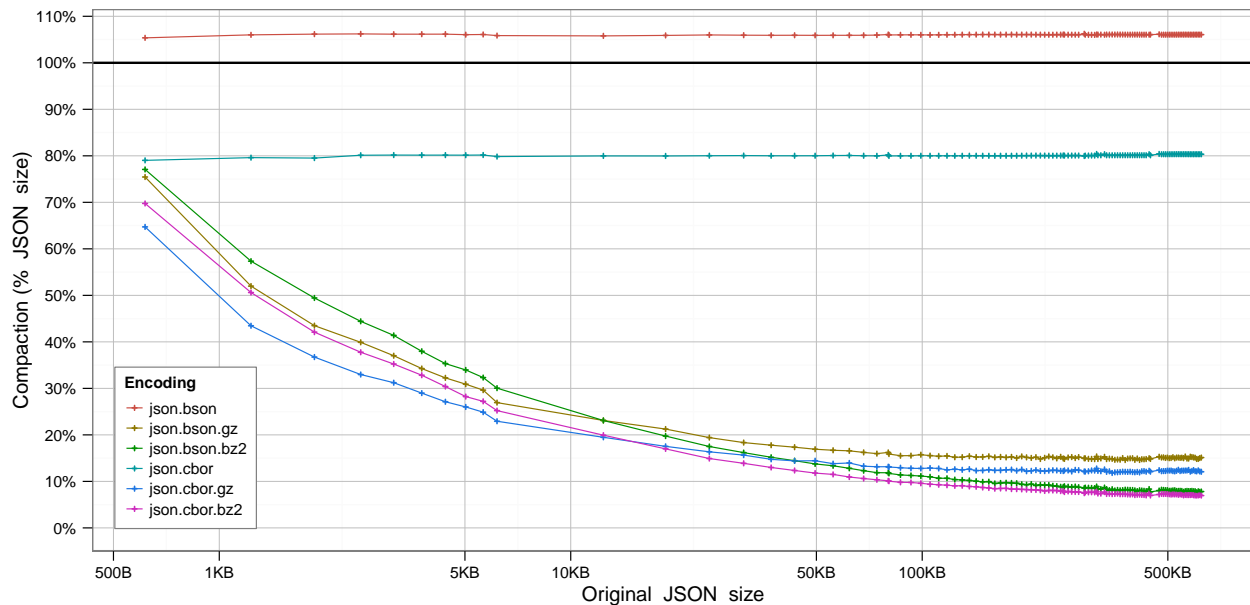
	json.gz	json.bz2	xml.gz	xml.bz2
## Min.	:0.1221	Min. :0.06609	Min. :0.1206	Min. :0.06598
## 1st Qu.	:0.1234	1st Qu.:0.06815	1st Qu.:0.1216	1st Qu.:0.06795
## Median	:0.1241	Median :0.07278	Median :0.1228	Median :0.07258
## Mean	:0.1444	Mean :0.10046	Mean :0.1441	Mean :0.10125
## 3rd Qu.	:0.1275	3rd Qu.:0.08509	3rd Qu.:0.1263	3rd Qu.:0.08519
## Max.	:0.6051	Max. :0.61958	Max. :0.6485	Max. :0.65650



JSON-Specific Exploratory

C. For binary JSON formats, does post-compression with conventional compression algorithms improve compactness?

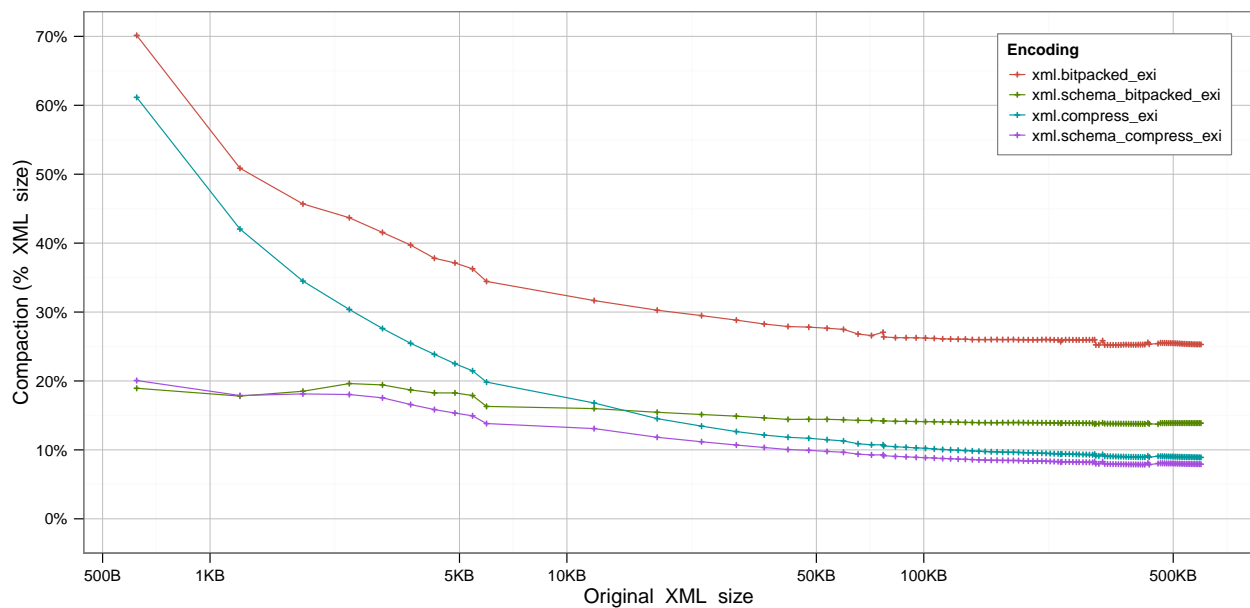
```
## [1] "Series:  json.bson, json.bson.gz, json.bson.bz2, json.cbor, json.cbor.gz, json.cbor.bz2"
## [1] "Baseline: json"
##      json.bson      json.bson.gz      json.bson.bz2      json.cbor
##  Min.   :1.054      Min.   :0.1459      Min.   :0.07670      Min.   :0.7902
## 1st Qu.:1.060      1st Qu.:0.1494      1st Qu.:0.08077      1st Qu.:0.8002
## Median :1.061      Median :0.1516      Median :0.08815      Median :0.8011
## Mean   :1.060      Mean   :0.1770      Mean   :0.12691      Mean   :0.8011
## 3rd Qu.:1.061      3rd Qu.:0.1547      3rd Qu.:0.10678      3rd Qu.:0.8034
## Max.   :1.062      Max.   :0.7545      Max.   :0.77073      Max.   :0.8040
##      json.cbor.gz      json.cbor.bz2
##  Min.   :0.1181      Min.   :0.06952
## 1st Qu.:0.1218      1st Qu.:0.07210
## Median :0.1233      Median :0.07733
## Mean   :0.1458      Mean   :0.11091
## 3rd Qu.:0.1278      3rd Qu.:0.09282
## Max.   :0.6472      Max.   :0.69756
```



EXI Exploratory

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

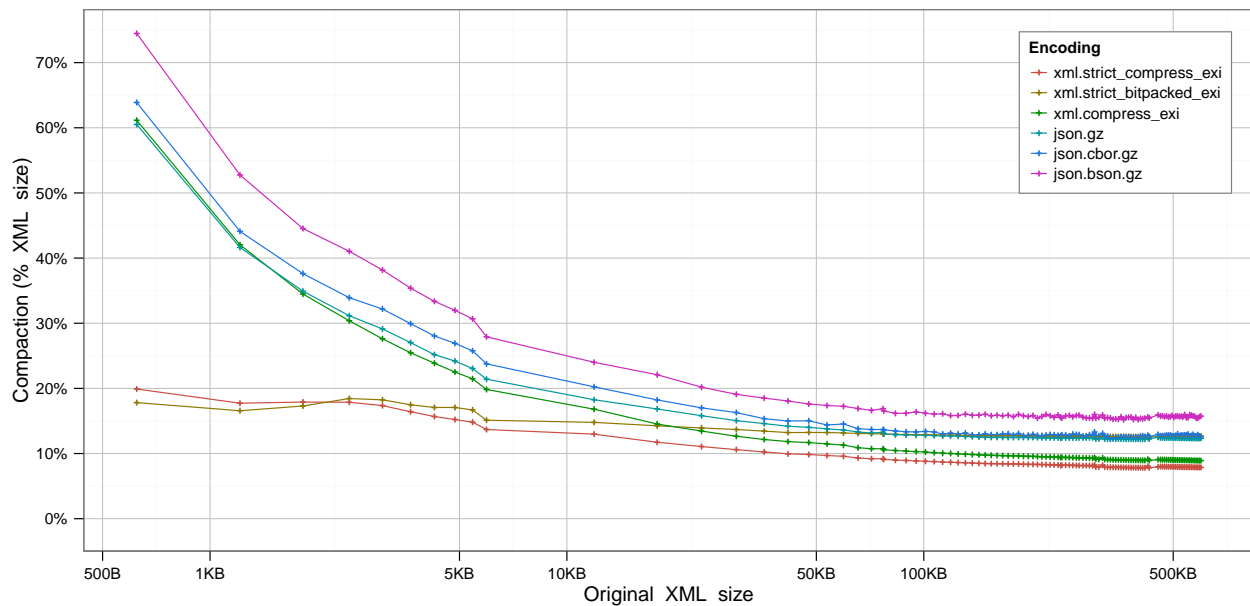
```
## [1] "Series:  xml.bitpacked_exi, xml.schema_bitpacked_exi, xml.compress_exi, xml.schema_compress_exi"
## [1] "Baseline:  xml"
##  xml.bitpacked_exi xml.schema_bitpacked_exi xml.compress_exi
##  Min.   :0.2521    Min.   :0.1374        Min.   :0.08912
##  1st Qu.:0.2536    1st Qu.:0.1388        1st Qu.:0.09023
##  Median :0.2596    Median :0.1390        Median :0.09382
##  Mean   :0.2761    Mean   :0.1440        Mean   :0.11635
##  3rd Qu.:0.2618    3rd Qu.:0.1408        3rd Qu.:0.10140
##  Max.   :0.7014    Max.   :0.1963        Max.   :0.61156
##  xml.schema_compress_exi
##  Min.   :0.07864
##  1st Qu.:0.07971
##  Median :0.08258
##  Mean   :0.09233
##  3rd Qu.:0.08820
##  Max.   :0.20064
```



Binary-comparisons

E. Which binary format is the most compact?

```
## [1] "Series:  xml.strict_compress_exl xml.strict_bitpacked_exl xml.compress_exl json.gz json.cb
## [1] "Baseline:  xml"
## xml.strict_compress_exl xml.strict_bitpacked_exl xml.compress_exl
## Min.      :0.07813      Min.      :0.1254      Min.      :0.08912
## 1st Qu.:0.07917      1st Qu.:0.1267      1st Qu.:0.09023
## Median :0.08203      Median :0.1269      Median :0.09382
## Mean    :0.09165      Mean    :0.1320      Mean    :0.11635
## 3rd Qu.:0.08761      3rd Qu.:0.1288      3rd Qu.:0.10140
## Max.    :0.19904      Max.    :0.1844      Max.    :0.61156
## json.gz json.cbor.gz json.bson.gz
## Min.    :0.1221    Min.    :0.1230    Min.    :0.1520
## 1st Qu.:0.1234    1st Qu.:0.1269    1st Qu.:0.1556
## Median :0.1241    Median :0.1286    Median :0.1579
## Mean    :0.1444    Mean    :0.1512    Mean    :0.1836
## 3rd Qu.:0.1275    3rd Qu.:0.1331    3rd Qu.:0.1611
## Max.    :0.6051    Max.    :0.6388    Max.    :0.7448
```



F. Do any of the binary formats offer improvement for a network already using gzip?

```
## [1] "Series:  xml.strict_compress_exi, xml.strict_bitpacked_exi, xml.compress_exi, json.gz, json.cb
## [1] "Baseline:  xml.gz"
## xml.strict_compress_exi xml.strict_bitpacked_exi xml.compress_exi
## Min.      :0.3069      Min.      :0.2748      Min.      :0.7333
## 1st Qu.:0.6503      1st Qu.:1.0151      1st Qu.:0.7419
## Median :0.6569      Median :1.0348      Median :0.7653
## Mean     :0.6575      Mean     :0.9811      Mean     :0.7850
## 3rd Qu.:0.6827      3rd Qu.:1.0418      3rd Qu.:0.8028
## Max.     :0.7072      Max.     :1.0439      Max.     :0.9696
## json.gz      json.cbor.gz      json.bson.gz
## Min.      :0.9332      Min.      :0.9851      Min.      :1.149
## 1st Qu.:1.0089      1st Qu.:1.0389      1st Qu.:1.271
## Median :1.0112      Median :1.0476      Median :1.279
## Mean     :1.0076      Mean     :1.0492      Mean     :1.279
## 3rd Qu.:1.0122      3rd Qu.:1.0551      3rd Qu.:1.289
## Max.     :1.0153      Max.     :1.1048      Max.     :1.315
```

