XML/JSON Analysis Template

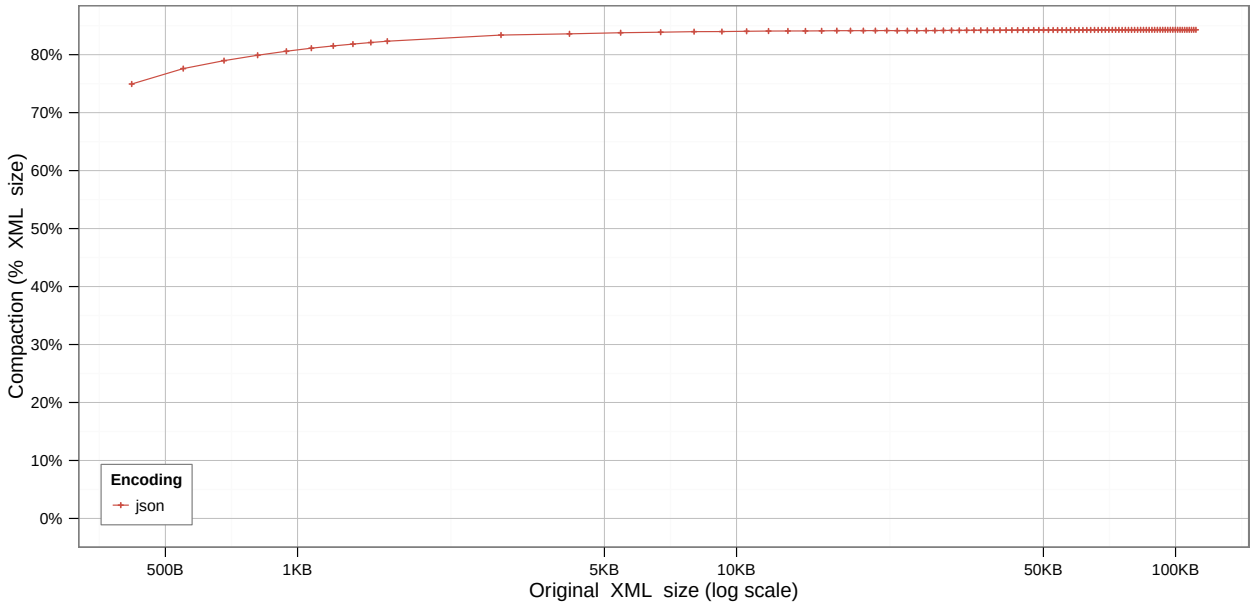
01 February, 2015

Results for Global Positioning System XML (GPX) Use Case

Plaintext Comparisons

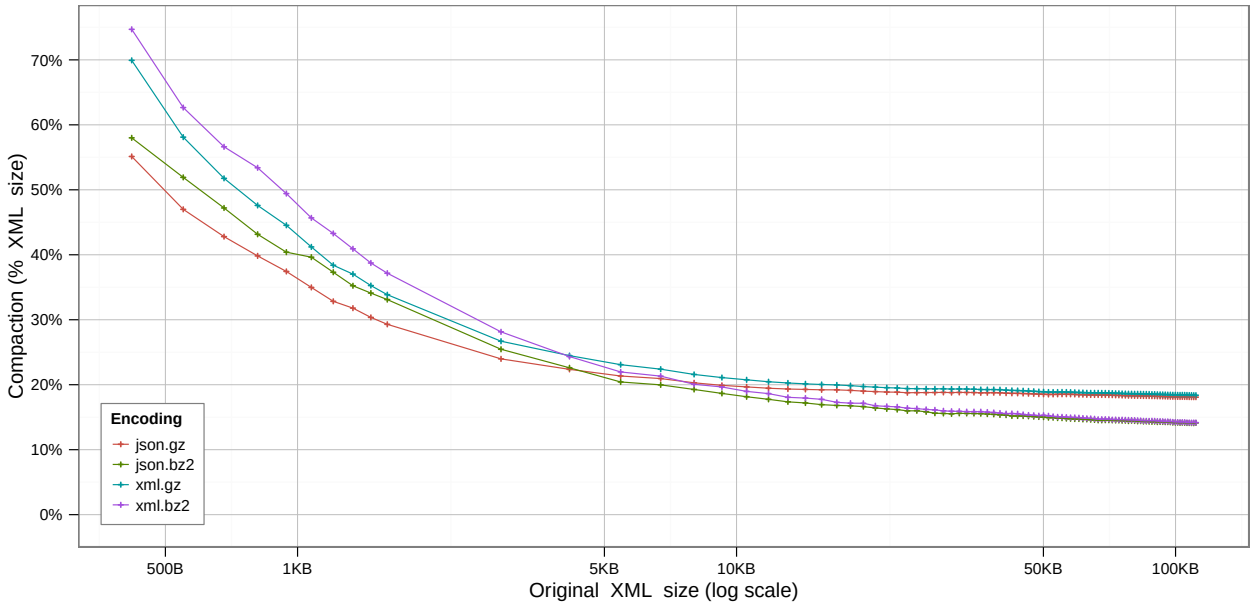
A. How do JSON and XML compare when plaintext-encoded?

```
## [1] "Series:   json"
## [1] "Baseline:  xml"
##       json
##  Min.   :0.7494
##  1st Qu.:0.8414
##  Median :0.8425
##  Mean   :0.8377
##  3rd Qu.:0.8428
##  Max.   :0.8429
```



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

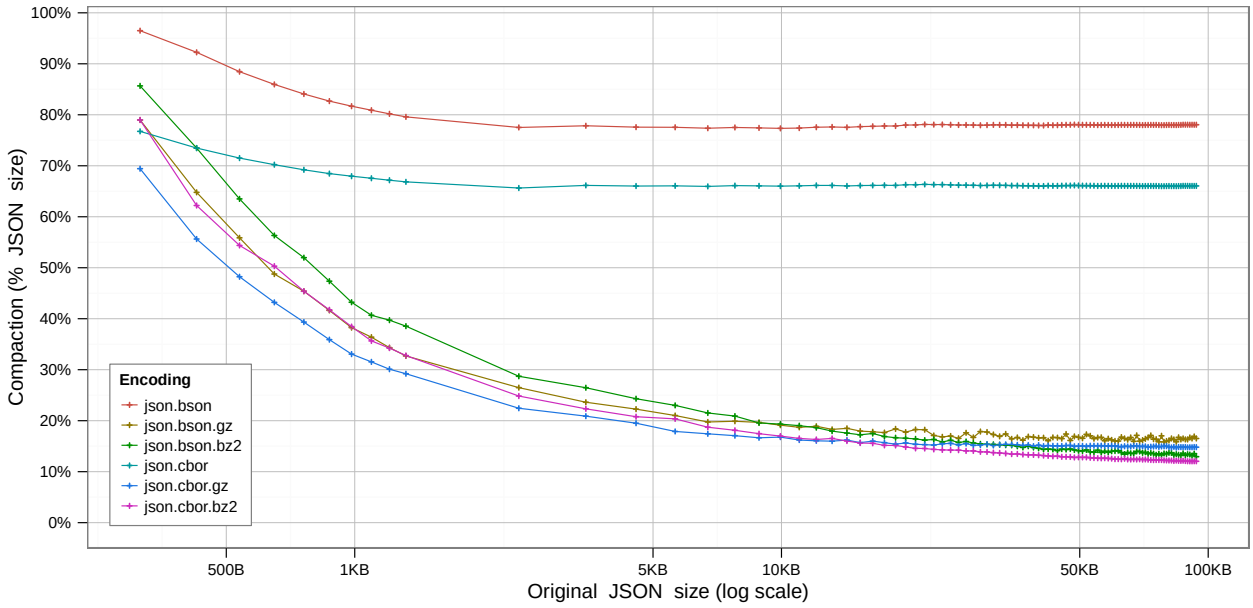
```
## [1] "Series:   json.gz, json.bz2, xml.gz, xml.bz2"
## [1] "Baseline:  xml"
##     json.gz          json.bz2          xml.gz          xml.bz2
##  Min.   :0.1808   Min.   :0.1408   Min.   :0.1838   Min.   :0.1416
##  1st Qu.:0.1829   1st Qu.:0.1440   1st Qu.:0.1860   1st Qu.:0.1454
##  Median :0.1853   Median :0.1497   Median :0.1890   Median :0.1522
##  Mean   :0.2076   Mean   :0.1822   Mean   :0.2202   Mean   :0.1938
##  3rd Qu.:0.1896   3rd Qu.:0.1647   3rd Qu.:0.1965   3rd Qu.:0.1685
##  Max.   :0.5513   Max.   :0.5800   Max.   :0.6993   Max.   :0.7470
```



JSON-Specific Exploratory

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

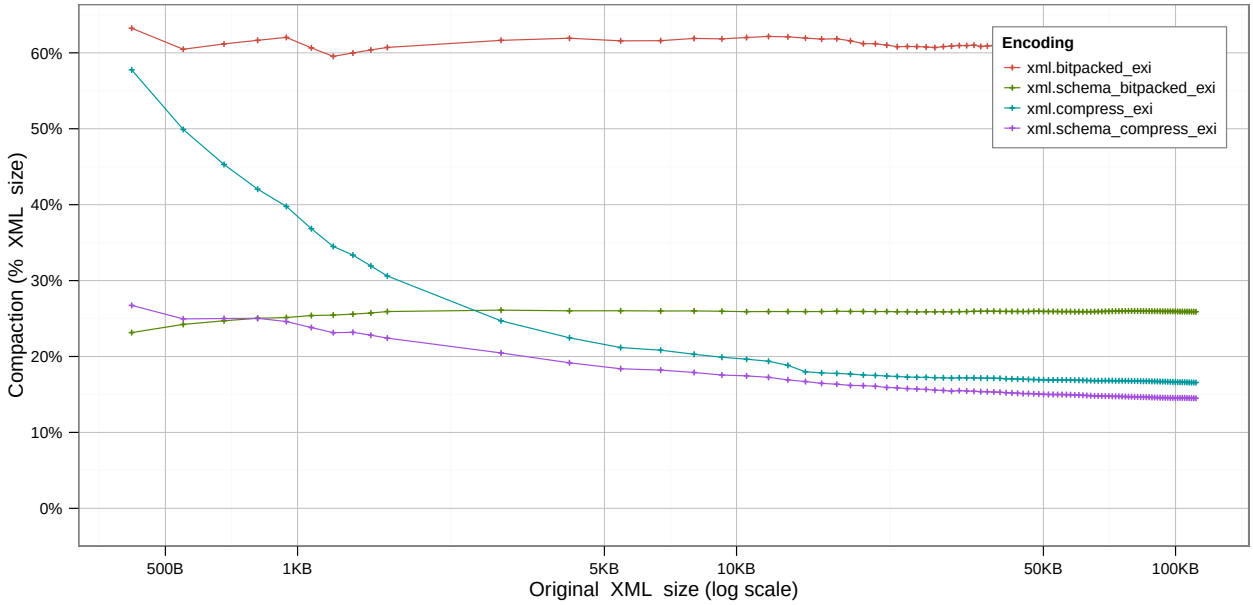
```
## [1] "Series:   json.bson, json.bson.gz, json.bson.bz2, json.cbor, json.cbor.gz, json.cbor.bz2"
## [1] "Baseline:  json"
##    json.bson       json.bson.gz    json.bson.bz2      json.cbor
##  Min.   :0.7734   Min.   :0.1584   Min.   :0.1294   Min.   :0.6564
##  1st Qu.:0.7796   1st Qu.:0.1647   1st Qu.:0.1370   1st Qu.:0.6604
##  Median :0.7801   Median :0.1677   Median :0.1443   Median :0.6607
##  Mean   :0.7869   Mean   :0.2044   Mean   :0.1942   Mean   :0.6648
##  3rd Qu.:0.7804   3rd Qu.:0.1824   3rd Qu.:0.1698   3rd Qu.:0.6615
##  Max.   :0.9650   Max.   :0.7898   Max.   :0.8567   Max.   :0.7675
##   json.cbor.gz    json.cbor.bz2
##  Min.   :0.1471   Min.   :0.1203
##  1st Qu.:0.1496   1st Qu.:0.1240
##  Median :0.1511   Median :0.1307
##  Mean   :0.1818   Mean   :0.1731
##  3rd Qu.:0.1569   3rd Qu.:0.1526
##  Max.   :0.6943   Max.   :0.7898
```



EXI Exploratory

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

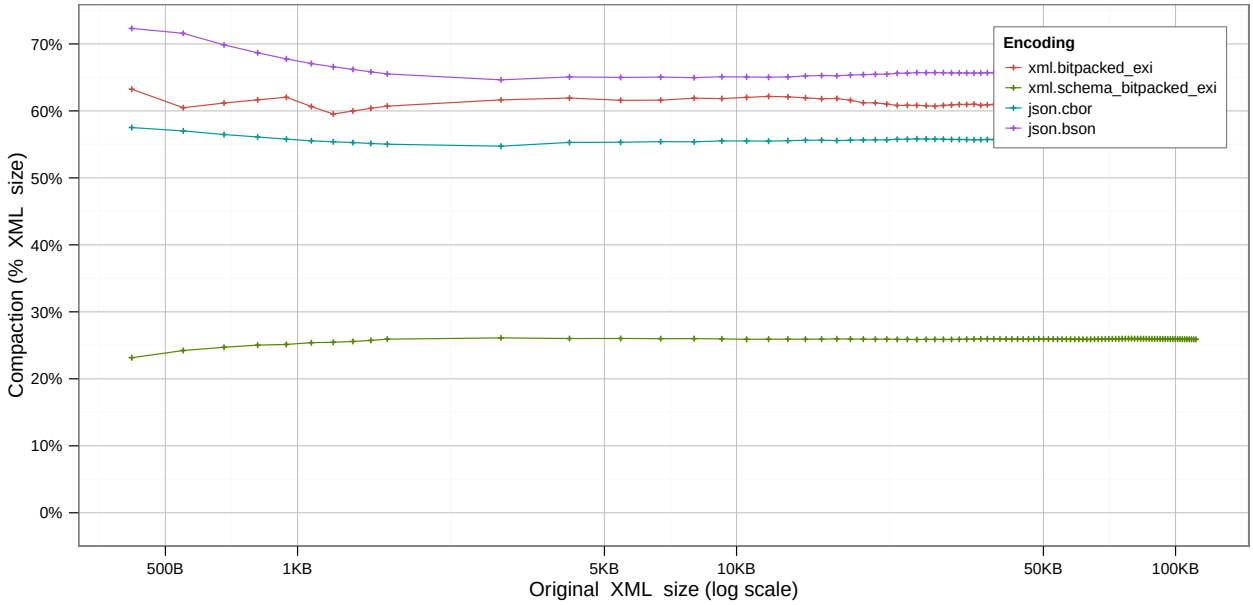
```
## [1] "Series:   xml.bitpacked_exi, xml.schema_bitpacked_exi, xml.compress_exi, xml.schema_compress_exi"
## [1] "Baseline:  xml"
##  xml.bitpacked_exi xml.schema_bitpacked_exi xml.compress_exi
##  Min.   :0.5791    Min.   :0.2315           Min.   :0.1656
##  1st Qu.:0.5927    1st Qu.:0.2591           1st Qu.:0.1677
##  Median :0.6012    Median :0.2593           Median :0.1692
##  Mean   :0.6011    Mean   :0.2585           Mean   :0.1973
##  3rd Qu.:0.6092    3rd Qu.:0.2596           3rd Qu.:0.1752
##  Max.   :0.6325    Max.   :0.2611           Max.   :0.5776
##  xml.schema_compress_exi
##  Min.   :0.1450
##  1st Qu.:0.1467
##  Median :0.1501
##  Mean   :0.1628
##  3rd Qu.:0.1610
##  Max.   :0.2673
```



Binary-comparisons

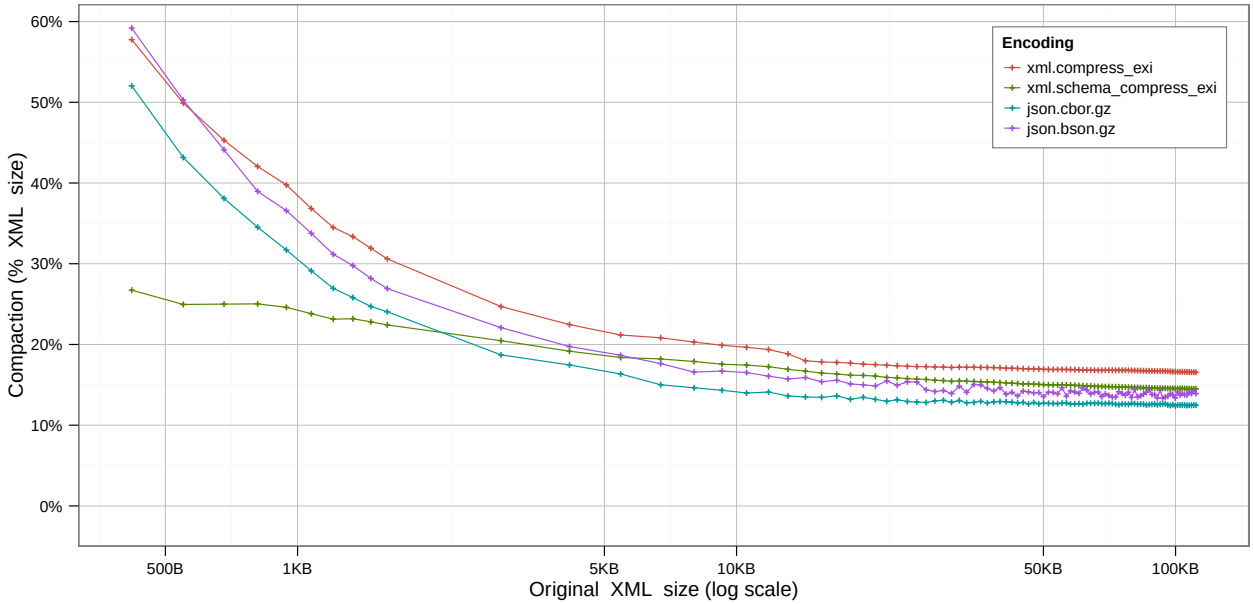
E. Does Bitpacked EXI beat BSON/CBOR?

```
## [1] "Series:   xml.bitpacked_exi, xml.schema_bitpacked_exi, json.cbor, json.bson"
## [1] "Baseline:  xml"
##  xml.bitpacked_exi xml.schema_bitpacked_exi   json.cbor
##  Min.   :0.5791    Min.   :0.2315           Min.   :0.5473
##  1st Qu.:0.5927    1st Qu.:0.2591           1st Qu.:0.5564
##  Median :0.6012    Median :0.2593           Median :0.5567
##  Mean   :0.6011    Mean   :0.2585           Mean   :0.5567
##  3rd Qu.:0.6092    3rd Qu.:0.2596           3rd Qu.:0.5569
##  Max.   :0.6325    Max.   :0.2611           Max.   :0.5752
##    json.bson
##  Min.   :0.6464
##  1st Qu.:0.6566
##  Median :0.6573
##  Mean   :0.6588
##  3rd Qu.:0.6575
##  Max.   :0.7232
```



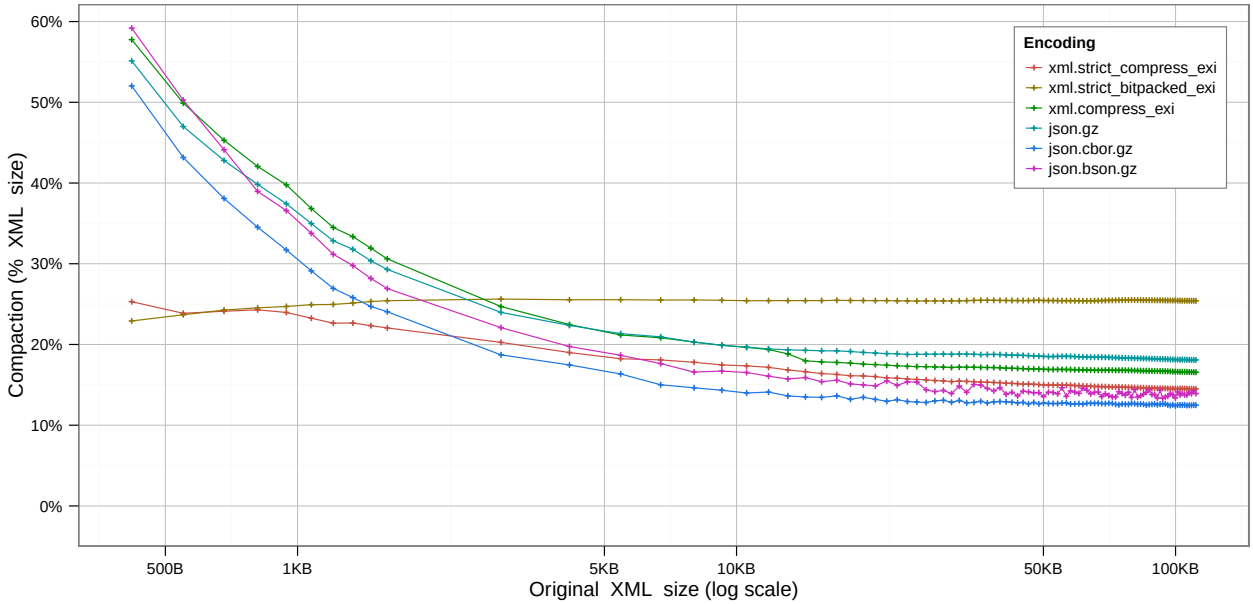
F. Does Compress EXI beat BSON/CBOR+Gzip?

```
## [1] "Series:   xml.compress_exi, xml.schema_compress_exi, json.cbor.gz, json.bson.gz"
## [1] "Baseline:  xml"
##  xml.compress_exi xml.schema_compress_exi  json.cbor.gz
##  Min.   :0.1656   Min.   :0.1450          Min.   :0.1240
##  1st Qu.:0.1677   1st Qu.:0.1467          1st Qu.:0.1261
##  Median :0.1692   Median :0.1501          Median :0.1273
##  Mean   :0.1973   Mean   :0.1628          Mean   :0.1510
##  3rd Qu.:0.1752   3rd Qu.:0.1610          3rd Qu.:0.1320
##  Max.   :0.5776   Max.   :0.2673          Max.   :0.5203
##   json.bson.gz
##  Min.   :0.1335
##  1st Qu.:0.1388
##  Median :0.1413
##  Mean   :0.1697
##  3rd Qu.:0.1535
##  Max.   :0.5919
```



G. Which binary format is the most compact?

```
## [1] "Series:   xml.strict_compress_exi, xml.strict_bitpacked_exi, xml.compress_exi, json.gz, json.cb
## [1] "Baseline:  xml"
##  xml.strict_compress_exi xml.strict_bitpacked_exi xml.compress_exi
##  Min.   :0.1448          Min.   :0.2291           Min.   :0.1656
##  1st Qu.:0.1466          1st Qu.:0.2542           1st Qu.:0.1677
##  Median :0.1499          Median :0.2544           Median :0.1692
##  Mean   :0.1617          Mean   :0.2536           Mean   :0.1973
##  3rd Qu.:0.1604          3rd Qu.:0.2547           3rd Qu.:0.1752
##  Max.   :0.2530          Max.   :0.2563           Max.   :0.5776
##     json.gz         json.cbor.gz     json.bson.gz
##  Min.   :0.1808   Min.   :0.1240   Min.   :0.1335
##  1st Qu.:0.1829   1st Qu.:0.1261   1st Qu.:0.1388
##  Median :0.1853   Median :0.1273   Median :0.1413
##  Mean   :0.2076   Mean   :0.1510   Mean   :0.1697
##  3rd Qu.:0.1896   3rd Qu.:0.1320   3rd Qu.:0.1535
##  Max.   :0.5513   Max.   :0.5203   Max.   :0.5919
```



H. 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.   :0.3618          Min.   :0.3276           Min.   :0.8259
##  1st Qu.:0.7876          1st Qu.:1.2941           1st Qu.:0.8915
##  Median :0.7891          Median :1.3460           Median :0.8974
##  Mean   :0.7684          Mean   :1.2473           Mean   :0.8985
##  3rd Qu.:0.7961          3rd Qu.:1.3707           3rd Qu.:0.9015
##  Max.   :0.8392          Max.   :1.3823           Max.   :0.9471
##     json.gz         json.cbor.gz     json.bson.gz
##  Min.   :0.7884   Min.   :0.6604   Min.   :0.7134
##  1st Qu.:0.9647   1st Qu.:0.6724   1st Qu.:0.7399
##  Median :0.9802   Median :0.6764   Median :0.7560
##  Mean   :0.9598   Mean   :0.6799   Mean   :0.7612
##  3rd Qu.:0.9831   3rd Qu.:0.6792   3rd Qu.:0.7770
##  Max.   :0.9838   Max.   :0.7440   Max.   :0.8652
```