

XML/JSON Analysis Template

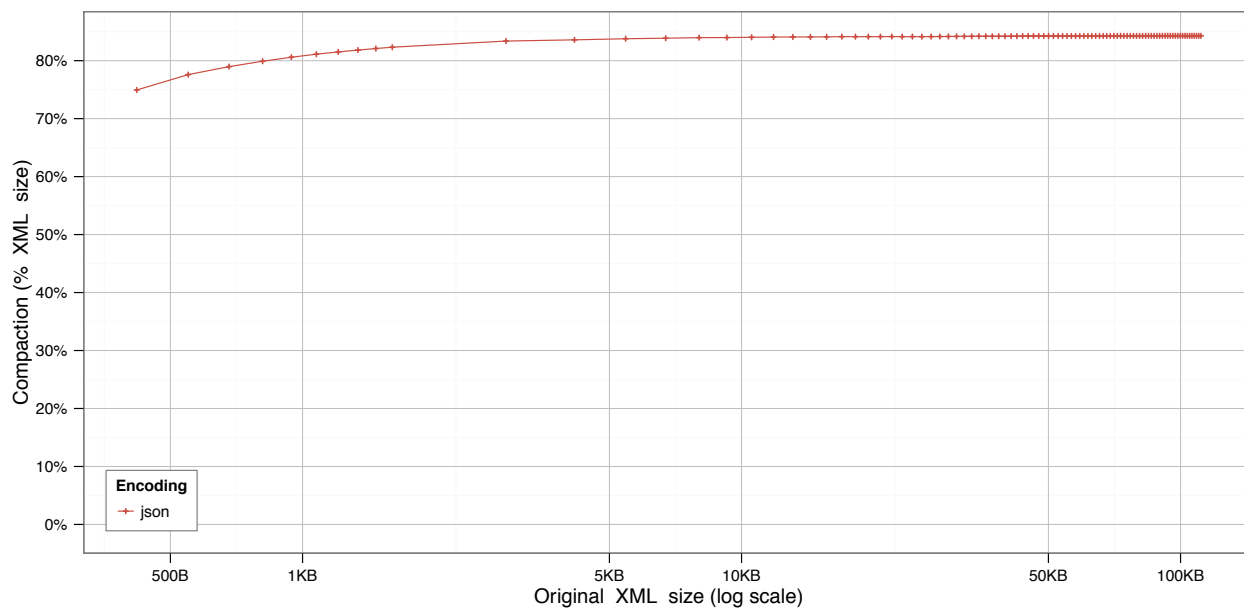
01 February, 2015

Results for Global Positioning System XML (GPX) Use Case

Plaintext Comparisons

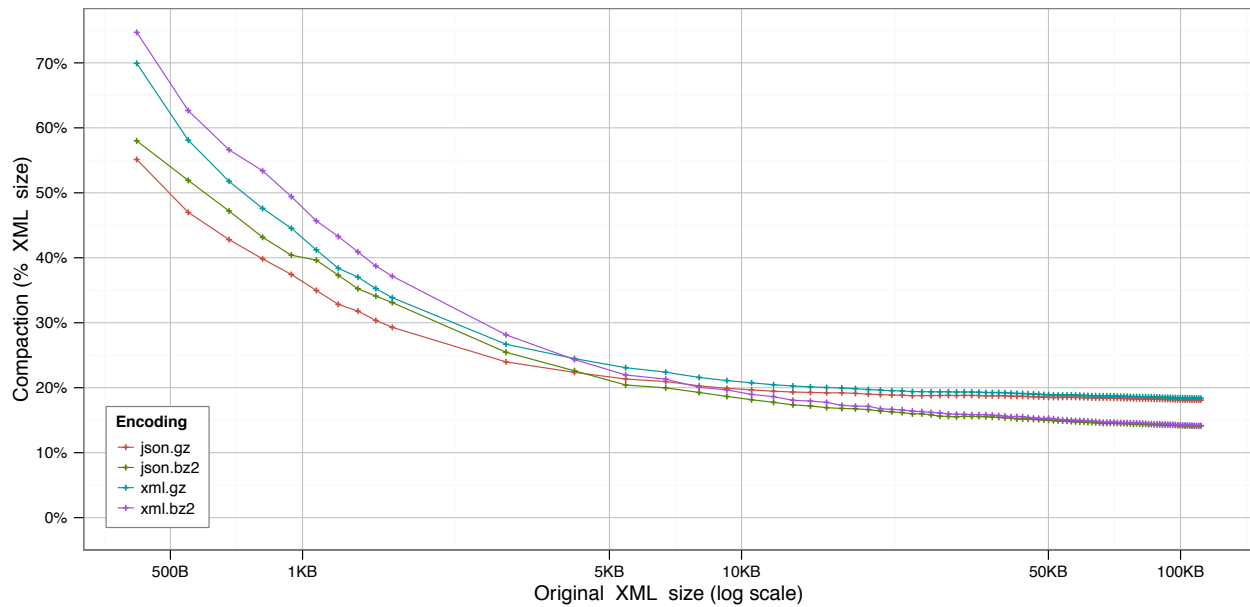
A. How do JSON and XML compare when plaintext-encoded?

```
## [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?

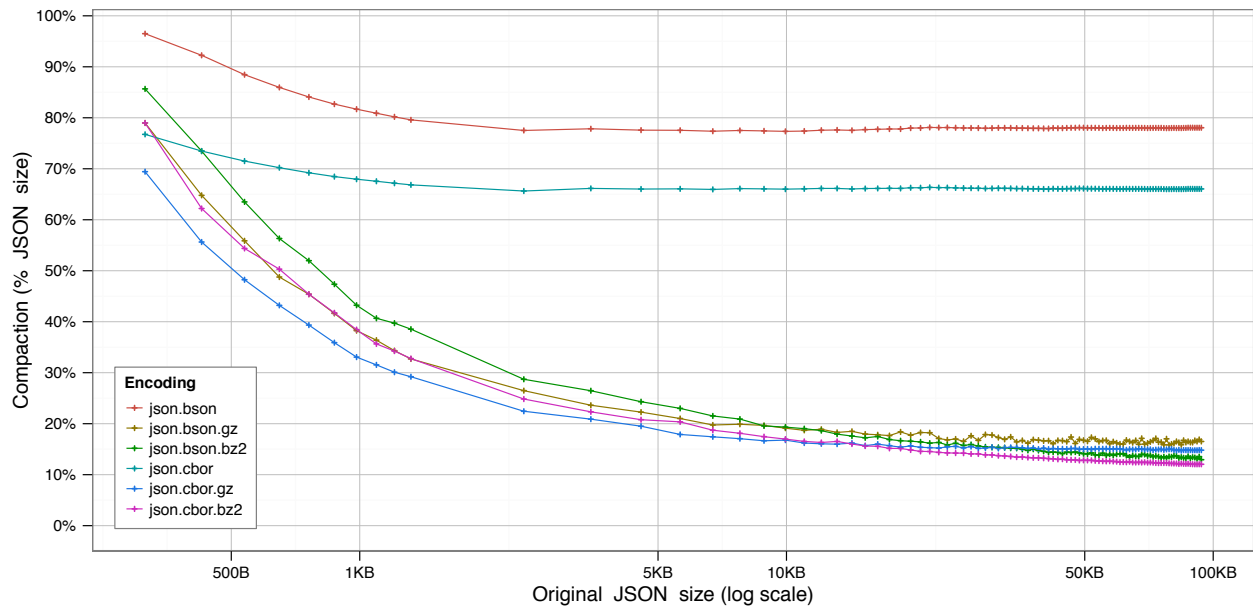
```
## [1] "Series:  json.gz, json.bz2, xml.gz, xml.bz2"
## [1] "Baseline:  xml"
##      json.gz      json.bz2      xml.gz      xml.bz2
## Min.   :0.1808   Min.   :0.1408   Min.   :0.1838   Min.   :0.1416
## 1st Qu.:0.1829   1st Qu.:0.1440   1st Qu.:0.1860   1st Qu.:0.1454
## Median :0.1853   Median :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?

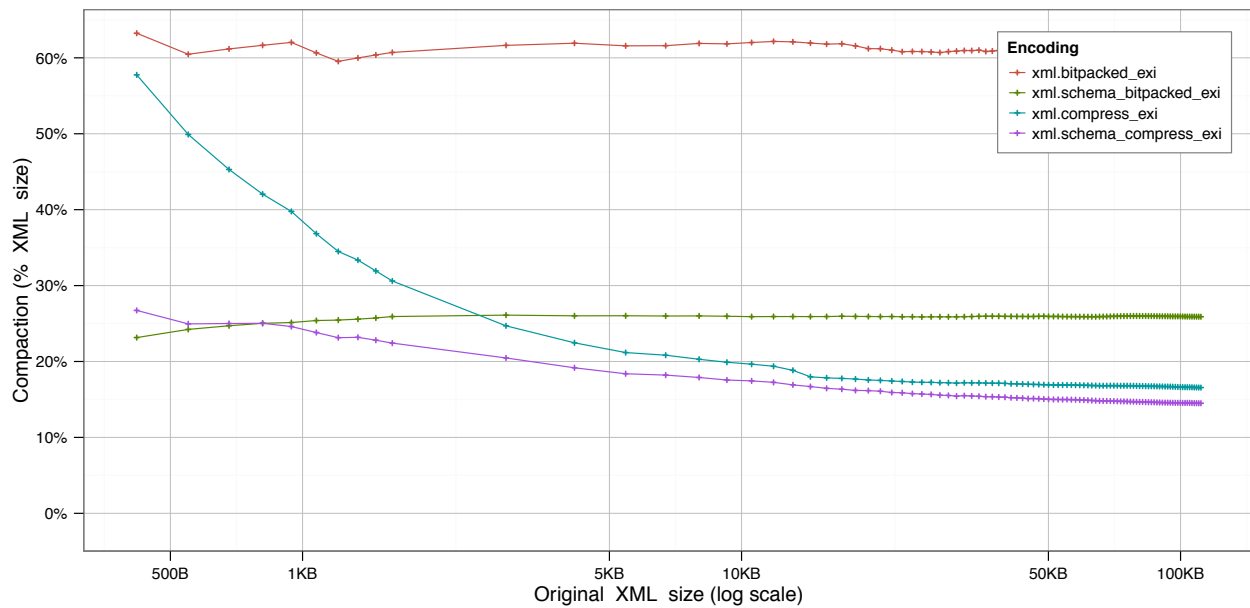
```
## [1] "Series:  json.bson, json.bson.gz, json.bson.bz2, json.cbor, json.cbor.gz, json.cbor.bz2"
## [1] "Baseline: json"
##      json.bson      json.bson.gz      json.bson.bz2      json.cbor
##  Min.   :0.7734    Min.   :0.1584    Min.   :0.1294    Min.   :0.6564
## 1st Qu.:0.7796    1st Qu.:0.1647    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?

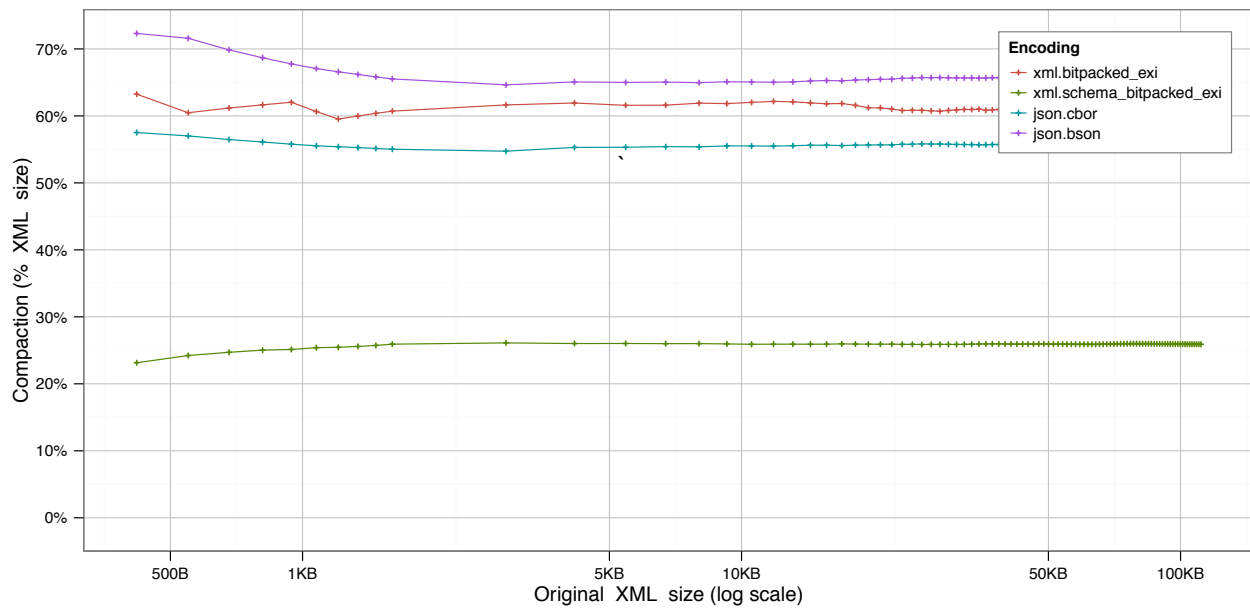
```
## [1] "Series:  xml.bitpacked_ex, xml.schema_bitpacked_ex, xml.compress_ex, xml.schema_compress_ex"
## [1] "Baseline:  xml"
##  xml.bitpacked_ex xml.schema_bitpacked_ex xml.compress_ex
## Min.   :0.5791    Min.   :0.2315        Min.   :0.1656
## 1st Qu.:0.5927    1st Qu.:0.2591        1st Qu.:0.1677
## 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_ex
## Min.   :0.1450
## 1st Qu.:0.1467
## Median :0.1501
## Mean   :0.1628
## 3rd Qu.:0.1610
## Max.   :0.2673
```



Binary-comparisons

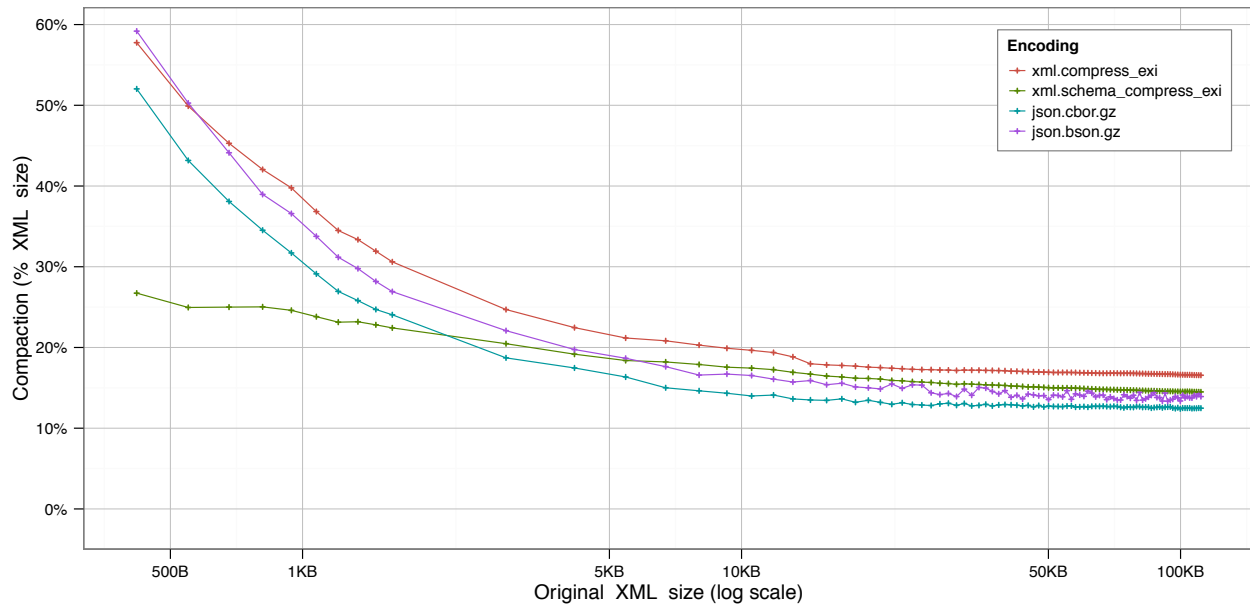
E. Does Bitpacked EXI beat BSON/CBOR?

```
## [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
```



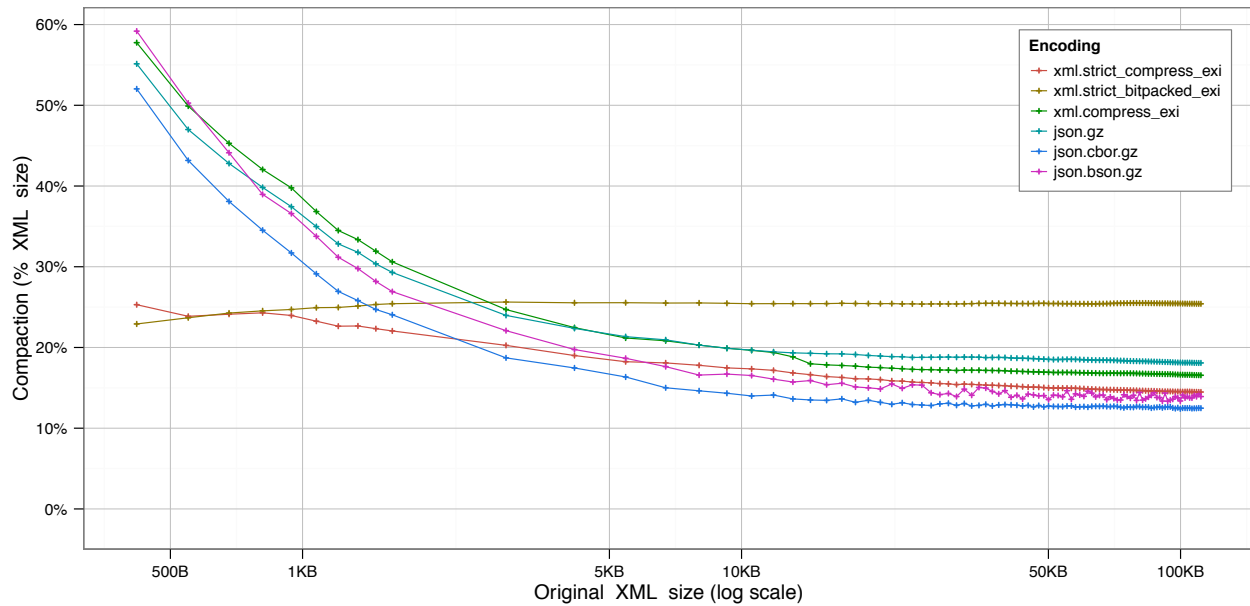
F. Does Compress EXI beat BSON/CBOR+Gzip?

```
## [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_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.      :0.1448          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
```

