Faster WAN Volume Operations with DPF

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Background

- High latency $\rightarrow$ slow Rx $\rightarrow$ slow AFS
  - $32 window * 1389 packetsize / 10 msRTT = 4.24 MiB/s$
  - $255 window * 1389 packetsize / 10 msRTT = 33.78 MiB/s$

- Previous talks:
  - 2012 EAKC "OpenAFS Out-of-Band TCP"
  - 2014 EAKC "OOB Update: Pipelines"

Disposable Protocol Framework (DPF)

- General protocol negotiation

- Rapid development

- TCP, on-the-fly compression (lz4), TLS

- Deployed in production (volserver 1.6)

DPF CLI

```
$ vos release/move/copy -dpf

$ vos release -no-dpf

$ vos release -dpf -s2s-dpf-pline $pipeline


$ vos dump -dpf -dpf-pline $pipeline


$ vos restore -dpf -dpf-pline $pipeline

davolserver -dpf -no-dpf -s2s-dpf default-on
```

Pipeline Spec

```
$ eof=net.sinenomine.eof32.duplex
$ fcrypt=net.sinenomine.crypt.fcrypt.clear.client
$ tcp=net.sinenomine.tcp.client
$ vos release -s2s-dpf-pline "$eof:$fcrypt:$tcp"

$ lz4=net.sinenomine.zip.lz4simple.send
$ rx=net.sinenomine.rx.sendrecv
$ vos release -s2s-dpf-pline "$lz4:$rx"
```

Release Progress

```
$ vos status $server
[...]
transaction: 310237   created: Wed Jan 30 17:05:24 2019
lastActiveTime: Wed Jan 30 17:05:24 2019
attachFlags:  offline
volume: 5381 7907  partition: /vicepa  procedure: Restore
packetRead  2  lastReceiveTime: Wed Jan 30 17:05:24 2019
packetSend  1  lastSendTime: Wed Jan 30 17:05:24 2019
```

Example Performance Impact

- 1G volume, WAN (across countries)

- Plain Rx:
    - ~20 minutes 16 sec
    - ~0.84 MiB/s

- DPF (tcp, lz4)
    - ~1 minute 12 sec
    - ~13 MiB/s

Specifying Options

- Pipeline spec is cumbersome

- Aliases?
  - `-dpf-pline eof:lz4:ssl:tcp`

- Higher-level flags
  - `-encrypt -compress -tcp`

Future

- Optimization

- Client/fileserver

- Standards?

- 1.9?

Code

Commits
Coming Soon!

Slides
`http://dson.org/talks`

?