# The big file emailing problem

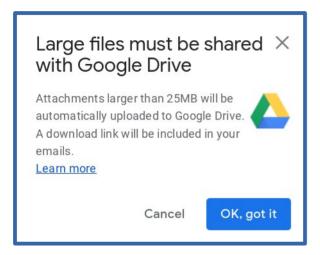
DISPATCH @IETF 111 / 26 Jul 2021 San Francciso / Virtual

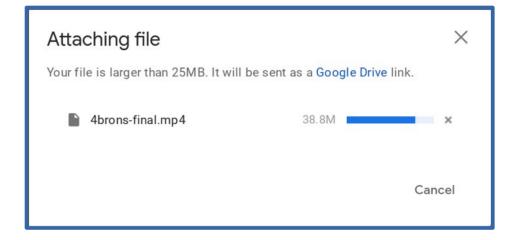
Bron Gondwana <br/> <br/>brong@fastmailteam.com>

### Problem Statement

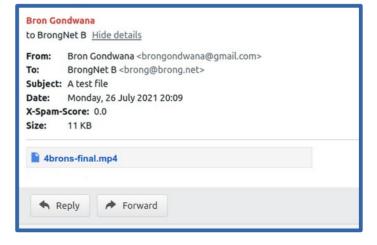
- End-users want to send files to each other
- Emails are limited to about 10Mb, as they have been for the past 20+ years
- The file sizes that end-users create keep getting bigger (4k video!)
- There is no standard solution

### Solutions

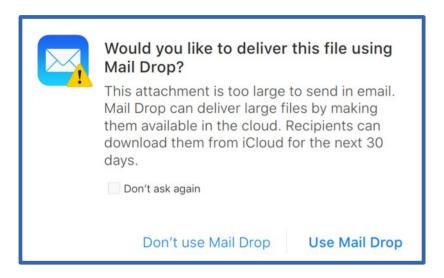




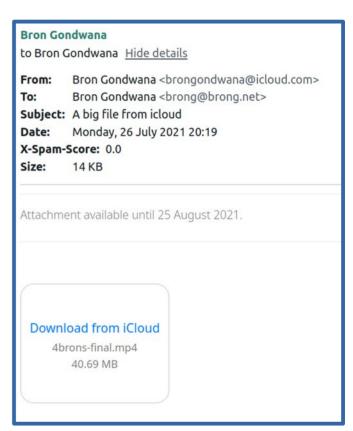




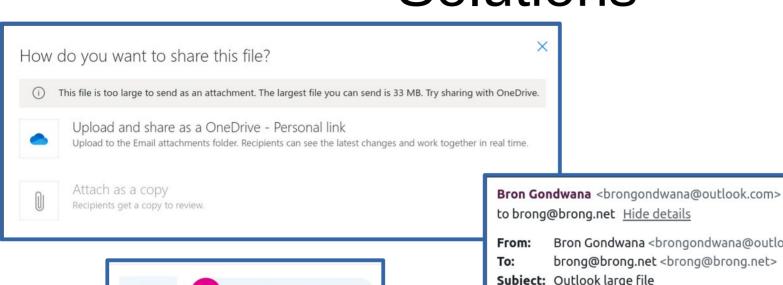
### Solutions

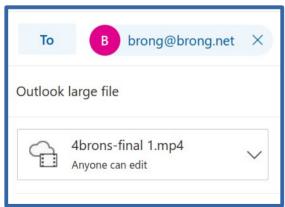


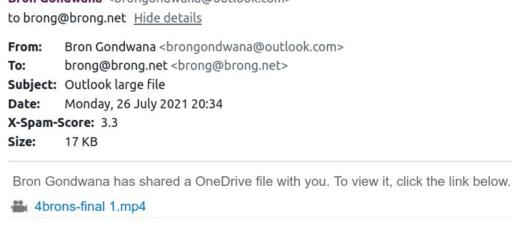




### Solutions







### Problems to solve

- 1. Upload of large files (restart)
- 2. Ownership/Responsibility of data
- 3. Discoverability/Embedability
  - Disposition: attachment vs inline
  - The virus-check / link follow problem
  - Search: "emails with attachments"

# 1. Upload of large files

- This is a general problem
  - → httpbis?
  - → httpapi?
- IMAP / SMTP doesn't support it
- We'd love this for JMAP
  - My blob draft allows server-side concatenation so you can duct tape it by uploading chunks and joining them server side, but it's horrible.

# 2. Ownership / Responsibility

- With "regular" emails, entire content is sent.
- Sender may keep a copy, but it's not necessary for the protocol.
- iCloud gives an expiry date, others don't even do that.
- Need a general way for recipient system to take a copy and tie lifetime to email lifetime.
- Centralised systems can upload and refcount, but email is decentralised.

#### **Gmail**:

--0000000000000fce15305c803f468

Content-Type: text/html; charset="UTF-8"
Content-Transfer-Encoding: quoted-printable

--0000000000000fce15305c803f468--

#### iCloud:

<html><body><div><div class=3D"x-apple-maildropbanner" data-expiration=3D"162988679200=</pre> 0" style=3D"font: 13px 'SFNSText', 'Helvetica Neue', sans-serif: color: #80= 8080; font-weight: 300; -webkit-text-size-adjust: 100%;"><div style=3D"hei= aht:0px: border-top:1px solid #ececec: margin-right:-20px"></div><div stvl=</pre> e=3D"height:53px: overflow:auto"><div style=3D"float:left: margin-top:13px= :: margin-right:62px"><div style=3D"height:19px; display:table-cell: verti= cal-align:bottom">Attachment available until 25 August 2021.</div></div><d= iv style=3D"float:right; width:62px; margin-left:-62px"></div></div><div s= tyle=3D"height:0px; border-top:1px solid #ececec; margin-bottom:15px; marg= in-right:-20px"></div></div><div><br data-mce-bogus=3D"1"></div><div cont= enteditable=3D"false"><div class=3D"x-apple-maildrop" data-url=3D"https://= cvws.icloud-content.com/B/AbENWWsn4MeuifvEuEtZbnCKeZ1vAbc\_ubslvYI13cAHOJfG= J4oEJxff/4brons-final.mp4?o=3DAjMORjIY11n\_LV5sEqsplEKI8KttyKwy6wivY8mbI1ED= &v=3D1&x=3D3&a=3DCAogaowjHA-jeolzYXMLAajFFyxX9G01ubqIyVSDQKtPB= vkSeBDk88-Sri8Y5IPL5rcvIqEAKqkC6AMA\_370Y4pSBIp5nW9aBAQnF99qJszIH7bWIfk0o88= rllRj0zDDBHynRd9jSTLQ9\_-HYMpQUUKRfvcpciYL1Ee7tElrLLWqbf9qpuL-sv15zklImFKWD= e1-d0X46Adlzjr\_WQ&e=3D1629886792&fl=3D&r=3D46a24c75-2a9a-40dc-= 8f99-70fbf3d2feaf-1&amp:k=3DCqxOt8pR-Hvum-ORtKCG00&amp:ckc=3Dcom.apple.lar= qeattachment&ckz=3DApple-Webmail&y=3D1&p=3D62&s=3DjeDLIitu= -D51C\_1F17WpJFw2Gwo" data-filename=3D"4brons-final.mp4" data-size=3D"40686= 498" data-expiration=3D"1629886792000" data-recordid=3D"668e7902-d2c9-4956= -a041-e1355868a247" style=3D"margin: 15px 15px 15px 0px; -webkit-text-size= -adjust: 100%;border: 1px solid #CACACA; border-radjus:15px;height:134px; = display:inline-block; vertical-align: middle; min-width:159px; font-family= :'SFNSText','Helvetica Neue',sans-serif; text-align: center;"><a target=3D= "\_blank" href=3D"https://www.icloud.com/attachment/?u=3Dhttps%3A%2F%2Fcvws= .icloud-content.com%2FB%2FAbENWWsn4MeuifvEuEtZbnCKeZ1vAbc\_ubslvYI13cAHOJfG= J4oEJxff%2F%24%7Bf%7D%3Fo%3DAl2RZzMVlwjCYMLXTpd4GMgoOfdiSGjgsVVppNEjKWi2%2= 6v%3D1%26x%3D3%26a%3DCAoqOHBMKtq1kq9ERB0Ep0h704q69Zhv35p9bjCb24GviS0SeBDu8= 8-Sri8Y7oPL5rcvIgEAKgkC6AMA\_37QiStSBIp5nW9aBAQnF99qJtLdb9TWDpJfPh\_RL1ISdIf= MOsiQci1tCywxpVITy3aXyGB1CeRWciaoBs32gsg5paPClJgOrxDqtjG4rkUG3aTsolm690\_Sc= Om626XxpQ%26e%3D1629886792%26f1%3D%26r%3D46a24c75-2a9a-40dc-8f99-70fbf3d2f= eaf-1%26k%3DCqxQt8pR-Hvum-QRtKCG0Q%26ckc%3Dcom.apple.largeattachment%26ckz= %3DApple-Webmail%26y%3D1%26p%3D62%26s%3DUK2OfVhtNyhmRzjVRTrOoPMYlv8&uk= =3D &amp:f=3D4brons-final.mp4&amp:sz=3D40686498" style=3D"text-decoration:= none: outline: 0; font-size: 14px; color: #007AFF; display:block; margin:4= Opx 10px 0px">Download from iCloud</a><div style=3D"text-align: center; fo=</pre> nt-size:12px; color:#808080"><div style=3D"margin:4px 10px 0px">4brons-fin= al.mp4</div><div style=3D"marqin:3px 10px 0px">40.69 MB</div></div></div><= /div></div></body></html>

#### **Outlook:**

```
<meta http-equiv=3D*Content-Type* content=3D*text/html; charset=3Diso-8859-=</pre>
<style type=30"text/css" style=30"display:none;"> P (margin-top:8;margin-bo=
ttom:0;) </style>
</head>
<!--[if Ite mso 15 || CheckWebRef]-->
cdiv ids30"OwaReferenceAttachments" contenteditables30"false">
<table style=30"border-width: @px @px lpx @px; border-color:#C7C7C7; border=
-style: none none dotted none:">
<table align=30"left" style=30"padding-right: 28px; border-width: 0px; back=
ground-color: rgb(255, 255, 255); border-spacing: @px">
<div id=3D*OwaReferenceAttachmentDescription* style=3D*padding-left; 3px; f=</pre>
ont-size: 14px; font-family: 'Segoe UI', 'Segoe WP', 'Segoe UI WPC', Tahoma=
 Arial, sans-serif; color: rgb(102, 102, 102);">
Bron Gondwana has shared a OneDrive file with you. To view it, click the li*
nk below.
<a href=30"https://ldrv.ms/u/s!AtaIQ_52v@oNsTI8_be@rnOufJ8d" target=30"=
<table align=30"left" style=30"padding-right: 28px; padding-bottom:18px; bo=
rder-width: @px; height:2@px; background-color: rgb(255, 255, 255); border-=
<div style=30"background-color: rgb(255, 255, 255); height: 20px; width: 20=</p>
px; max-height: 20px;">
<a href=30"https://idrv.ms/u/s!AtaIO 52v@oNsTI8 be@rnQufJ8d" target=30" bla=
nk"><ing width=30"20" style=30"border:0px;" src=30"https://rl.res.office365=
 .com/owa/prem/images/dc-mpg_20.png"></a></div>
<div id=3D*OwaReferenceAttachmentFileName2* style=3D*padding: @px @px @px S+</p>
px; font-size: 14px; font-family: 'Segoe UI', 'Segoe WP', 'Segoe UI WPC', T=
ahoma, Arial, sams-serif; color: rgb(0, 114, 198);">
<a href=30"https://ldrv.ms/u/s!AtaIQ_52v0oNsTI8_beOrnOufJBd" target=30"_bla=
nk" style=30"text-decoration: none; margin: @px; font-size: 14px; font-fami=
ly: 'Segoe UI', 'Segoe WP', 'Segoe UI WPC', Tahoma, Arial, sans-serif; colo-
r: rgb(0, 114, 198); ">4brons-final 1.mp4</a></div>
4/122
<div id=3D"OwaReferenceAttachmentsEnd" style=3D"display:none:visibility:hid=</pre>
<div style=30"font-family: Calibri, Helvetica, sans-serif; font-size: 12pt;=</pre>
color: rob(0, 0, 0):">
```

- Arbitrarily following links from emails is dangerous (GET side effects, content can change, timing/privacy leaks)
- Hard to know which links are "attached files"
- Lifetime uncertain
- Content can change after delivery (bypass virus and spam checks)

## Proposal

- Upload work to one of the http groups
- Ownership/Discovery: new MIME type, something like: application/remotecontent
- Digest for content integrity protection and immutability
- Expiry timestamp tied to link
- UUID for deduplication and data lifetime
- Content-ID linkability within the message
- Recipient server SHOULD download a copy to virus check and then retain it for the lifetime of the email

### e.g.

```
----= Part 385484 783853576.1627029384108
Content-Type: application/remote-data
Remote-Location: <a href="https://foo.com/attachments/randomid.mp4">https://foo.com/attachments/randomid.mp4</a>; expires=2021-07-25T00:00:00
Remote-Location: https://archive.foo.com/archive/randomid.mp4;
expires=2021-12-31T23:59:59
Remote-Size: 12345678
Remote-Digest: Sha256-
hex=e0f9b4c2ecf96b43c1a5c40bc92e7ff655c28dd7e4c2f18f5e4fd62d6330b0c3;
  Sha1-hex=b1df92447144f2549c69b1ff5627e59292038898
Remote-Content-Type: video/mp4
Remote-Disposition: attachment
<body>
This is a remote attachment, you can download it at <a href="https://foo.com/attachments"
/randomid.mp4">https://foo.com/attachments/randomid.mp4</a>.
</body>
-----=_Part_385484_783853576.1627029384108--
```

### Conclusion

- Has this already been solved somewhere and I just don't know where to look?
- Am I barking up entirely the wrong tree?
  - I assume SMTP isn't going to allow gigabyte files
  - I assume users are going to keep wanting to email larger and larger files.
  - I assume that email recipients want the lifetime of the files they have been sent to be identical to the emails themselves (so if they don't delete the email, they don't lose the file)
  - We need this for calendar event attachments too... and presumably every other messaging system has the same problem.
- Is there interest in doing work in this space?
  - What is a sensible group for it if so?
  - Who wants to get involved?