

EXHIBIT 2

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
OAKLAND DIVISION

WHATSAPP INC., a Delaware corporation, and FACEBOOK, INC.,
a Delaware corporation,
a Delaware corporation,
Plaintiffs,
v. Case No. 4:19-cv-07123-PJH
NSO GROUP TECHNOLOGIES LIMITED
and Q CYBER TECHNOLOGIES LIMITED,
Defendants.

HIGHLY CONFIDENTIAL--ATTORNEYS' EYES ONLY

VIDEO-RECORDED 30(b)(6) and 30(b)(1)

DEPOSITION OF

WHATSAPP INC., by and through its Designated

Representative,

CARL WOOG

Palo Alto, California 94304

Wednesday, August 14, 2024

Reported Stenographically by:
MARY J. GOFF
CSR No. 13427
WA CSR No. 21030779
Job No. 3226
PAGES 1-384

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1 working with great intensity to identify what was
2 going on.

3 Q So you have never spoken to [REDACTED]
4 [REDACTED], as far as you know?

5 A Sorry. I don't believe so, but I don't
6 recall if I have.

7 Q Do you know at all what his
8 responsibilities with respect to either WhatsApp or
9 Facebook were?

10 A Not that I recall.

11 Q Do you know whether Mr. Robinson was
12 attributing the exploitation of this vulnerability
13 to NSO as of May 5, 2019?

14 A Sir I do not know what Mr. Robinson
15 determined at that -- at that point in time.

16 Q Do you know if WhatsApp more generally was
17 attributing anything to NSO as of May 5, 2019?

18 A I believe that was our -- our -- our
19 strongest hypothesis that the team was working to
20 validate and confirm.

21 Q And do you know what that was based on?

22 A Sir, I -- my recollection, I recall
23 security engineers telling me that they believed
24 that NSO was attacking our users.

25 And this was an attack that was underway,

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1 phones app to app, those are indeed end-to-end
2 encrypted. We usually refer to those as personal
3 images.

4 Q All right. So all WhatsApp personal
5 messages are end-to-end encrypted?

6 A Yes, sir.

7 Q And all WhatsApp calls are end-to-end
8 encrypted?

9 A Yes, sir.

10 Q Is that true both with respect to voice
11 calls and video calls?

12 A Yes, voice and video calls are both
13 protected by end-to-end encryption on an
14 application-to-application basis.

15 Q Does a WhatsApp user have to pay extra for
16 the end-to-end encryption or is that a standard
17 feature?

18 A That's a standard feature, sir, and it
19 cannot be turned off.

20 Q So it's impossible to have a WhatsApp
21 account -- a personal WhatsApp account without
22 end-to-end encryption, correct?

23 A That is how our service works, sir.

24 Q So yes?

25 A Yes.

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1 and they were working to put to stop.

2 Q And do you know what that was based on,
3 that attribution to NSO?

4 A Sir, based on their technical expertise.

5 Q So you don't know?

6 A I'm not a technical expert, no, sir.

7 Q Okay. So you don't know?

8 A No, sir.

9 ATTORNEY ANDRES: Objection, asked and
10 answered.

11 Q (BY ATTORNEY AKROTIRIANAKIS) Are all
12 WhatsApp chats end-to-end encrypted?

13 A Sir, we have a distinction between what we
14 refer to as "personal WhatsApp chats" and chats that
15 are with businesses that use a technology service
16 called an "API." We have a White Paper that explains
17 this. Generally.

18 I think the way we think of WhatsApp is
19 kind of how people like you and me would chat with
20 one another, but we also have these business
21 services.

22 Those business services using the API, we
23 do not designate those at end-to-end encrypted. But
24 what people are thinking of when they are using
25 their WhatsApp in their handset on their -- on their

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1 Q How much does it cost for a user to
2 establish a WhatsApp account?

3 A Sir --

4 ATTORNEY ANDRES: Objection, relevance.

5 A -- sir, accounts are free to establish.
6 There's no cost.

7 Q (BY ATTORNEY AKROTIRIANAKIS) So what --
8 what does a person need in order to set up a
9 WhatsApp account?

10 A Sir, you need a mobile phone, and you need
11 the ability to download the app from either the
12 Apple App Store or the Google Play Store.

13 Or you can also download the app directly
14 from our website, if you're having trouble accessing
15 those stores. And then you download that
16 application onto your phone.

17 And then from there you open the app.
18 There'll be some information there about our Terms
19 of Service that you would need to agree to prior to
20 using our service.

21 And then there's just some initial setup
22 questions that -- that we have. And then from there
23 you're pretty much off and running.

24 Q Well, what are the initial setup
25 questions?

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1 **A Well --**
 2 ATTORNEY ANDRES: Objection, relevance.
 3 **A -- well -- so you have to enter your phone**
 4 **number in order to effectively activate your**
 5 **account.**
 6 **So you enter your phone number, and that**
 7 **will send an SMS message to you, which you -- you**
 8 **type in a code for that, and then that allows you to**
 9 **start your account.**
 10 **I think we also ask for a name, which is**
 11 **optional. You can choose your actual name. You can**
 12 **choose a nickname. I think there's an option to put**
 13 **in a photo and things like that, which you can do,**
 14 **if you chose.**
 15 **And after that, you're able to chat freely**
 16 **and securely.**
 17 **Q (BY ATTORNEY AKROTIRIANAKIS) So the "Name**
 18 **Field" is not required?**
 19 **A I don't believe so, sir. I think you have**
 20 **to enter something in that name, but you don't have**
 21 **to chose your actual name.**
 22 **Does that --**
 23 **Q Could --**
 24 **A -- distinction make sense?**
 25 **Q Okay. It could be literally anything?**

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1 setting the account?
 2 **A I think that's fair to say, sir, yes.**
 3 **Q Okay. But assuming that somebody is an**
 4 **actual person, literally anybody could sign up for a**
 5 **WhatsApp account, as long as they have a mobile**
 6 **phone and the ability to download the WhatsApp app,**
 7 **correct?**
 8 **A Right. And then that text message**
 9 **authentication that I mentioned. Those basic steps.**
 10 **Q Right. But you don't, like, say: Like,**
 11 **well, is this a person who we really want using our**
 12 **system?**
 13 **They just decide themselves, right?**
 14 **A That's right.**
 15 **Q Can a person have multiple WhatsApp**
 16 **accounts with different phone numbers?**
 17 **A Yes. But basically a phone number -- an**
 18 **easier way of thinking of it is that an account is**
 19 **tied to a phone number.**
 20 **So if you have two phones, then you could**
 21 **have a WhatsApp on one phone and a WhatsApp on the**
 22 **other phone. That would be two accounts, but you**
 23 **may be the same -- the same person. We have that.**
 24 **And then we also have the ability to**
 25 **have -- we have multiple -- the ability to install**

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1 **A I believe so.**
 2 **Q It could be symbols? It doesn't even have**
 3 **to be letters?**
 4 **A I don't know if you can use symbols.**
 5 **That -- sometimes apps have trouble with symbols.**
 6 **But perhaps. I don't know for sure. You**
 7 **have to put in something, I believe, in that field.**
 8 **Q But it doesn't have to be your name?**
 9 **A It does not have to be your name, sir.**
 10 **Q Other than what you have described right**
 11 **now, is there any other vetting that WhatsApp does**
 12 **prior to granting a user account to someone?**
 13 **A Sir, I'm not an expert in this, but we do**
 14 **have quite a talented group of people that are**
 15 **looking for signals of inauthenticity and perhaps**
 16 **abuse right from the setup time.**
 17 **So what we're looking for there is**
 18 **potentially accounts that may be intended to be set**
 19 **up for spam or automation or other account setup**
 20 **that is inauthentic in some way.**
 21 **I'm drawing to draw a distinction between**
 22 **that and a normal person who is just trying to use**
 23 **WhatsApp for private and secure calls.**
 24 **Q So like a -- you're trying to ferret out**
 25 **whether it's an actual person or a bot that's**

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1 **multiple apps on one phone.**
 2 **So for example, we have the WhatsApp app**
 3 **and we have WhatsApp Business app.**
 4 **And you could use your phone and download**
 5 **both instances of WhatsApp on your phone.**
 6 **And the reason why some people want to do**
 7 **that is because they're a small business and they**
 8 **like to separate their chats from their personal use**
 9 **and their business use. So it effectively gives**
 10 **them two Inboxes to do so.**
 11 **And the Business app has some of its**
 12 **own -- different policies and rules that I'm less**
 13 **familiar with. But effectively that's designed for**
 14 **the small business owner that relies on WhatsApp to,**
 15 **you know, run their business, respond to customer**
 16 **inquiries, and hopefully run a successful business**
 17 **that -- for their customers.**
 18 **Q So let's go back to the names.**
 19 **You said that -- that you have to -- that**
 20 **your belief is that you have to put in something in**
 21 **the -- in the "Setup" field that requests a name,**
 22 **but it's incons -- inconsequential what it is that's**
 23 **put into that field; is that fair?**
 24 **A That's fair. It's a user choice.**
 25 **Q And that's permitted by the WhatsApp Terms**

EXHIBIT 3

to Declaration of Micah G. Block in Support of
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Page 1

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
OAKLAND DIVISION

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VIDEO-RECORDED 30(b)(6) and 30(b)(1)

DEPOSITION OF

WHATSAPP INC., by and through its Designated
Representative,

CLAUDIU GHEORGHE

Palo Alto, California 94304

Friday, August 16, 2024

Reported Stenographically by:
MARY J. GOFF
CSR No. 13427
WA CSR No. 21030779
Job No. 3296
PAGES 1-295

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1 **A I'm confused.**
 2 Q Let me rephrase. Scratch that.
 3 **A Yeah.**
 4 Q Are the stanzas in XML?
 5 **A I believe it was an XML protocol, yes.**
 6 Q Okay. And so the format of the stanzas is
 7 defined somewhere?
 8 **A Like right now?**
 9 Q In 2019. All of my questions will be
 10 about how the system was in May of 2019.
 11 **A Okay. I believe there was a -- like a**
 12 **text document that described the stanzas in the**
 13 **protocol.**
 14 **In one of the repositories that we had, it**
 15 **was called "the common repo" that was referenced by**
 16 **all the client and the server engineers.**
 17 **And at that time we actually had a formal**
 18 **representation of the protocol in another system**
 19 **that actually led to the discovery of the attack --**
 20 Q All right.
 21 **A -- so there was -- yeah.**
 22 Q So a stanza, which you said is an
 23 XML-defined message --
 24 **A Yes.**
 25 Q -- has a certain -- certain structure to

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1 (Exhibit 1167 was marked for
 2 identification and is attached to the transcript.)
 3 Q (BY ATTORNEY WEINBERG) I want to chat with
 4 you a bit about the stanzaming. Is that how you
 5 pronounced it, stanzaming?
 6 **A Stanzaming.**
 7 Q Got it.
 8 Do you recognize this document?
 9 **A Yes.**
 10 Q What is it?
 11 **A It displays a SEV that was filed for the**
 12 **incident.**
 13 Q Okay. What is an SEV?
 14 **A Yeah, so a SEV or S-E-V is a formal**
 15 **document used by Facebook to track the operational**
 16 **or security incidents within the company.**
 17 Q Okay. And what would I call this kind of
 18 document? Is this a chat? Is this -- what kind of
 19 a system is this kept in?
 20 ATTORNEY BLOCK: Objection to form.
 21 **A So I'm trying -- like, I don't know**
 22 **exactly how to explain this as a concept. Outside**
 23 **it -- it's kind of like a task, but it's really not**
 24 **like a task. It's more like a project, like, if I**
 25 **would have to explain it in a different way.**

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1 it?
 2 **A Yes.**
 3 Q And so that structure would involve some
 4 parameters and parameter values -- sort of parameter
 5 names and parameter values?
 6 ATTORNEY BLOCK: Objection to form.
 7 **A It involves that, but not just that.**
 8 Q (BY ATTORNEY WEINBERG) What else does it
 9 involve?
 10 **A It involves other types of stanzas as well**
 11 **that are child stanzas. So there's like a hierarchy**
 12 **of stanzas, essentially.**
 13 Q All right. So it's XML, so it's a
 14 hierarchical --
 15 **A Yeah.**
 16 Q -- structure?
 17 **A Yeah.**
 18 Q And so an offer stanza, for example, is a
 19 kind of VoIP stanza?
 20 **A It's a type of stanza, yeah.**
 21 Q Okay. And so the structure for that kind
 22 of stanza is defined in this common repo?
 23 **A Yeah.**
 24 Q Okay. Let me put a document in front of
 25 you. 1167.

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1 Q (BY ATTORNEY WEINBERG) And so what's
 2 reflected here in this document is the actions and
 3 messages -- actions taken and messages sent for this
 4 SEV project, the stanzaming project?
 5 ATTORNEY BLOCK: Objection to form.
 6 **A Yes.**
 7 Q (BY ATTORNEY WEINBERG) Okay. I would like
 8 you to take a quick look at page 3. Towards the
 9 bottom it says that -- there's a message from
 10 [REDACTED] on Monday, May 6, at -- 2019,
 11 at 12:27 p.m.?
 12 **A Yes.**
 13 Q And he says that the WhatsApp engineering
 14 work for this SEV investigation is coordinated by
 15 you; is that accurate?
 16 **A Yes.**
 17 Q And what does that mean, it was
 18 "coordinate -- well, what is "engineering work" that
 19 he is referring to?
 20 **A It is the engineering work required to**
 21 **investigate and remediate the attack.**
 22 Q And the engineering work comprises what?
 23 **A It involved a lot of steps and a lot of**
 24 **work from -- not just from me, but from a larger**
 25 **group of people.**

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1 Q Okay. I guess I'm just trying to get a
2 sense of what distinguishes engineering work from
3 some other category of work that you may have not
4 been responsible for.
5 Would you be able to shed some light on
6 that?
7 ATTORNEY BLOCK: Objection to form.
8 **A Like, what was the nonengineering work?**
9 Q (BY ATTORNEY WEINBERG) Well, if you're
10 coordinating the engineering work, was there other
11 kinds of work that you weren't coordinating or were
12 you coordinating all the work?
13 ATTORNEY BLOCK: Objection to form and --
14 **A I was coordinating just the engineering at**
15 **WhatsApp.**
16 ATTORNEY BLOCK: -- just pause and give me
17 a chance to object before you start your answer,
18 please.
19 Q (BY ATTORNEY WEINBERG) Okay. And so what
20 does "coordinating network" mean?
21 **A Coordination in this case means scoping**
22 **work that needs to be done in order to achieve the**
23 **goal.**
24 Q And monitoring its progress as well, I
25 assume?

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1 the --
2 **A They --**
3 Q -- clients?
4 **A -- facilitate the connection -- the**
5 **realtime connection between the devices.**
6 Q What's difference between facilitating and
7 establishing?
8 **A In some cases there's direct**
9 **communication -- realtime communication between the**
10 **devices.**
11 **So if I call you, in some scenarios the**
12 **packets will actually not go through the relay. But**
13 **in order to establish -- to -- like, in order to**
14 **establish that channel, you have to go through the**
15 **relay first. But the actual packets are not proxied**
16 **in that case.**
17 **So in about 50 percent of the cases, the**
18 **relay acts as a proxy; but in the rest of them, it**
19 **does not act as a proxy.**
20 Q How do you determine -- or how does the
21 system determine whether the relay will be acting as
22 a proxy between clients and when it will not?
23 **A It is based on heuristics and whether**
24 **we -- we can establish a direct connection between**
25 **the devices or not.**

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1 **A Ensuring progress in monitoring, yes.**
2 Q It lists five tasks that were -- that you
3 were coordinating here.
4 Would you be able to just introduce us to
5 each of these five tasks and what they entailed?
6 **A So Number 1 -- and by the way, I don't**
7 **remember all the details of these tasks right now,**
8 **so I'll do my best to say it based on what I**
9 **remember.**
10 **Number 1, "logging packets from attackers**
11 **in EdgeRay," this task was about logging data from**
12 **the relay servers for the calls that we flagged at**
13 **"suspicious" and as part of the attack.**
14 Q What are the relay servers?
15 **A The relay servers are the servers**
16 **responsible for handling the realtime traffic**
17 **between devices during a call on WhatsApp.**
18 Q So they're a proxy between WhatsApp
19 clients?
20 ATTORNEY BLOCK: Objection to form.
21 **A They're not just proxy. They are -- they**
22 **have an essential role in establishing the realtime**
23 **channel between the devices.**
24 Q (BY ATTORNEY WEINBERG) The relay servers
25 also work in establishing the connection between

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1 **In some scenarios, it's not possible. The**
2 **network configuration does not allow that to -- to**
3 **happen.**
4 Q So the relay servers will proxy
5 information between the clients whenever it's not
6 possible for the clients to communicate with each
7 other directly; is that accurate?
8 ATTORNEY BLOCK: Objection to form.
9 **A Yes.**
10 Q (BY ATTORNEY WEINBERG) I have seen a lot
11 of references to "signaling servers" in the
12 documents.
13 What's the difference between the relay
14 servers and the signaling servers?
15 **A There are two main flows in establishing**
16 **the call on WhatsApp. The first part that happens**
17 **at the beginning when you set up the call is called**
18 **signaling.**
19 **And the second part that happens -- that**
20 **transfers the real -- makes the realtime**
21 **communication between the devices is the relay.**
22 Q I guess I need some clarification. The --
23 you said earlier that the relay servers facilitate
24 the creation of the connection?
25 **A Of the realtime channel.**

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1 Q Of the realtime channel.
 2 So could you clarify what's the difference
 3 between establishing the creation of the realtime
 4 channel versus initiating -- setting up a call,
 5 which is done by the signaling servers?
 6 ATTORNEY BLOCK: Objection to form.
 7 **A So just to clarify, the difference between**
 8 **the -- yeah.**
 9 Q (BY ATTORNEY WEINBERG) Yeah, sorry. The
 10 signaling servers, you said, set up the call.
 11 And then you said that the relay servers
 12 will help establish the realtime channel and then
 13 sometimes proxy data from one client to the other;
 14 is that accurate?
 15 **A Yes.**
 16 ATTORNEY BLOCK: Objection, misstates the
 17 testimony.
 18 Q (BY ATTORNEY WEINBERG) Could you expound a
 19 little bit on that -- those two different functions?
 20 **A Yes. So the setup of the call always**
 21 **starts with the signaling server. And the signaling**
 22 **server is the same server that we use for chat, so**
 23 **it's synonymous with chatserver.**
 24 Q Is that what's referred to as the
 25 chatdservers --

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1 **A Yes.**
 2 Q And that was a position you held from 2019
 3 to 2021?
 4 **A Yes.**
 5 Q Could you describe your work and
 6 responsibilities in that position?
 7 **A So the main responsibility that I had for**
 8 **the WhatsApp application security team is to drive**
 9 **the roadmap for hardening and improving security**
 10 **across WhatsApp.**
 11 Q And was this a new position created in
 12 response to the stanzaming incident?
 13 ATTORNEY BLOCK: Objection to form;
 14 foundation.
 15 **A I'm not sure what you mean by -- like, in**
 16 **response to that.**
 17 Q (BY ATTORNEY WEINBERG) Was there a
 18 security team before you took over as the security
 19 engineering manager?
 20 ATTORNEY BLOCK: Objection to form.
 21 **A There were people working on security, but**
 22 **it was not a team dedicated to it.**
 23 Q (BY ATTORNEY WEINBERG) What's the
 24 difference?
 25 **A So we had, for instance, a security**

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1 **A Yes.**
 2 Q -- in the --
 3 **A The VoIP signaling is a module within**
 4 **chatd.**
 5 Q And so the voice signaling uses the chat
 6 functionality of WhatsApp to establish calls?
 7 **A To start the call.**
 8 Q To start the call.
 9 And once it starts the call, the -- the
 10 relay server establishes the realtime channel?
 11 **A Exactly.**
 12 Q And then half the time -- or some portion
 13 of the time that relay server will then proxy data
 14 between the two clients and in other instance it
 15 will -- the two clients will access -- will
 16 communicate directly in a peer-to-peer fashion?
 17 ATTORNEY BLOCK: Objection to form.
 18 **A Yes.**
 19 Q (BY ATTORNEY WEINBERG) So we will get into
 20 all of this in detail in a little bit. I just
 21 wanted to close the loop on this resume.
 22 In 2019, shortly after the stanzaming
 23 investigation, your title changed to software
 24 engineering manager for application security; is
 25 that correct?

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1 **partner that was assigned to WhatsApp.**
 2 **And part of the security team was not**
 3 **just -- not just hiring new people that worked full**
 4 **time for WhatsApp, but it was also working**
 5 **cross-functionally with other teams in Facebook like**
 6 **the Facebook security team.**
 7 **And there were already people assigned to**
 8 **WhatsApp before we had the team. It was just not**
 9 **organized in the same way that we did it after.**
 10 Q Do you remember in 2019, when you became
 11 the software engineering manager for application
 12 security, who you reported to?
 13 **A The first manager that I had was [REDACTED]**
 14 **[REDACTED].**
 15 Q And you had another manager after that,
 16 evidently?
 17 **A Yeah, he left the company. And then the**
 18 **next manager that I had was [REDACTED].**
 19 Q And then how big was your team by the end
 20 of 2019?
 21 **A By the end of 2019, I have to remember,**
 22 **but I think we only had three years, I believe, in**
 23 **the team.**
 24 Q And who were they?
 25 **A I believe [REDACTED] and [REDACTED]**

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1 correct?

2 ATTORNEY BLOCK: Objection to form.

3 Q (BY ATTORNEY WEINBERG) I'll rephrase.

4 The ultimate choice of a physical server

5 that processes the request is the result of

6 WhatsApp's algorithms by choice?

7 ATTORNEY BLOCK: Objection to form;

8 misleading.

9 **A The load balancer that takes the decision**

10 **of which physical server is actually provided by**

11 **Facebook infrastructure. That's not what the**

12 **WhatsApp team works on.**

13 Q (BY ATTORNEY WEINBERG) So the -- I guess

14 we did speak about WhatsApp's DNS. We talked about

15 ISP's DNS. And now we're talking about Facebook's

16 load balancers, right?

17 **A Yes.**

18 Q And those are all components owned by --

19 or operated by parties other than the user, correct?

20 ATTORNEY BLOCK: Objection to form.

21 **A I'm not sure about the concept of, like,**

22 **parties other than the user. What --**

23 Q (BY ATTORNEY WEINBERG) Those are --

24 **A -- does that mean?**

25 Q Those are server programs controlled by

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1 Q Okay. Did Pegasus send requests that

2 specified the physical server that would handle the

3 request?

4 ATTORNEY BLOCK: Objection to form;

5 foundation.

6 You can answer, if you know.

7 **A I don't know what Pegasus did.**

8 Q (BY ATTORNEY WEINBERG) All right. But you

9 have no evidence or reason to believe then that

10 Pegasus sent requests into this infrastructure and

11 targeted a specific physical server location?

12 ATTORNEY BLOCK: Objection,

13 mischaracterizes; calls for speculation.

14 **A I don't know whether they targeted or not.**

15 **I just don't know.**

16 Q (BY ATTORNEY WEINBERG) All right. Can I

17 ask you a few questions about the -- hang on.

18 Scratch that. All right.

19 That was a really great side from where we

20 left off with the signaling server. I think that's

21 where we left off. We were talking about the

22 signaling server initiating a VoIP call and how it

23 did that, and we just discussed the physical and

24 transport layer infrastructures, the routing

25 infrastructures that it uses. So back up to the

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1 Facebook and WhatsApp and the ISP?

2 ATTORNEY BLOCK: Objection to form.

3 **A Facebook.**

4 Q (BY ATTORNEY WEINBERG) Okay. The -- can a

5 user choose the specific physical server that

6 ultimately would process his request?

7 ATTORNEY BLOCK: Objection to form.

8 **A By "user," you mean a human?**

9 Q (BY ATTORNEY WEINBERG) I'll try -- I'll

10 start with that, sure.

11 **A There's -- we don't provide a way for --**

12 **for the user to choose what server will process the**

13 **request.**

14 Q So it's not possible for a client to send

15 a request into WhatsApp's infrastructure and specify

16 which server -- physical server will process that

17 request?

18 ATTORNEY BLOCK: Objection to form.

19 **A By "client," you mean an official WhatsApp**

20 **client?**

21 Q (BY ATTORNEY WEINBERG) Let's start with

22 that.

23 **A Sure. A WhatsApp official client does not**

24 **allow setting the -- the physical server that will**

25 **handle the request.**

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1 application layer, if we could.

2 The signaling server, which you said was

3 the chatdserver helps a client establish a call, you

4 said?

5 ATTORNEY BLOCK: Objection to form.

6 **A I don't remember exactly what I said.**

7 Q (BY ATTORNEY WEINBERG) If you would open

8 up the -- the White Paper, you'll see right there in

9 that -- on page 4, the "WhatsApp VoIP

10 Infrastructure":

11 WhatsApp VoIP infrastructure

12 has server and client applications.

13 The server functions as an

14 intermediary between the WhatsApp

15 applications, helping them to

16 establish a call, as well as

17 proxying VoIP data between clients

18 once the call starts.

19 Do you see that?

20 **A Yes.**

21 Q Okay. So we are talking -- that's two

22 different operations.

23 One of them is establishing the call. The

24 other one is -- is proxying data once the call

25 starts. So I would like, to talk about that first

<p style="text-align: right;">Page 114</p> <p>1 A So these are concurrent. So as soon as 2 the caller receives -- the -- the callee receives 3 the offer, as soon as it's processed and it starts 4 ringing in the same time, it also sends back a 5 confirmation to the server that it started ringing. 6 And I don't recollect specifically the 7 name of that stanza, but I think it's a -- I think 8 it's an offer ACK that is being sent. 9 Q (BY ATTORNEY WEINBERG) Okay. What then 10 does the chatdserver do once it receives this offer 11 ACK? 12 A I think what it does is it forwards the 13 ACK to the call so that the caller can also start 14 the ring -- the ringing process. 15 Q Have you heard the term "offer" -- 16 sorry -- "Answer stanza"? 17 A Yes. 18 Q I saw it in some of the documents. 19 What is it is Answer stanza? 20 A The Answer stanza, I believe, is the 21 stanza that is sent from the callee at the moment 22 the user presses the "Answer" button and accepts the 23 call. 24 Q All right. So at our current step, the 25 chatdserver sent the offer ACK back to the -- to the</p>	<p style="text-align: right;">Page 115</p> <p>1 caller; and now if the callee picks up the phone, 2 his device will send an Answer stanza somewhere? 3 A To the chatd. 4 ATTORNEY BLOCK: Objection to form. 5 Q (BY ATTORNEY WEINBERG) The caller, once 6 the caller picks up the phone, the caller's phone 7 will send an Answer stanza back to the chatdserver, 8 right? 9 ATTORNEY BLOCK: Object to form. 10 A The caller will send back an answer when 11 the user presses the "Answer" button, yes. 12 ATTORNEY BLOCK: Did you say "caller" or 13 "callee" on that one? I got confused. 14 Q (BY ATTORNEY WEINBERG) The callee would 15 send the answer? 16 ATTORNEY BLOCK: I think we have got 17 testimony about the "caller" sending an answer 18 stanza. 19 ATTORNEY AKROTIRIANAKIS: I'm sure she is 20 going to have to listen when she goes through it, I 21 hope. 22 A Yeah, that's not accurate. So the answer 23 is only sent by the callee. 24 Q (BY ATTORNEY WEINBERG) Got it. All right. 25 At that point is there a peer-to-peer connection</p>
<p style="text-align: right;">Page 116</p> <p>1 established? 2 A No. 3 ATTORNEY BLOCK: Objection to form. 4 Q (BY ATTORNEY WEINBERG) Okay. So what 5 happens next? 6 A Even before the answer happens, there's a 7 negotiation process between the caller and the 8 callee about the latency, about the bandwidth that 9 is going to be used. So all that negotiation 10 happens before there's any -- any answer. 11 Q Okay. So then I'll go back one step. 12 The chatdserver sent the offer ACK to the 13 caller and now a negotiation process begins, you 14 say? 15 ATTORNEY BLOCK: Objection to form. 16 A Sorry. So the -- the caller -- can you 17 repeat the last part? 18 Q (BY ATTORNEY WEINBERG) The callee sends an 19 acknowledgment back to the chatdserver, the offer 20 acknowledgment, and what happens next? 21 You talked about a negotiation process. 22 ATTORNEY BLOCK: Objection to form. 23 A The chat server will forward the offer ACK 24 or send another stanza that I don't remember its 25 name. But it would signal to the callee, the fact</p>	<p style="text-align: right;">Page 117</p> <p>1 that the caller has been reached and the offer was 2 ACK'd by the callee. 3 And once they both know that -- both -- 4 they know about each other, that they're aware that 5 there's a call happening, this is when the -- the 6 relay and bandwidth negotiation starts happening. 7 Q (BY ATTORNEY WEINBERG) Okay. Tell me 8 about what you mean by "the relay and bandwidth 9 negotiation." 10 ATTORNEY BLOCK: Objection to form. 11 A About each of them or -- 12 Q (BY ATTORNEY WEINBERG) I just want to know 13 the steps that are involved in the negotiation 14 process that you just mentioned. 15 ATTORNEY BLOCK: Objection to form. 16 Wait for a question. 17 Q (BY ATTORNEY WEINBERG) What are the steps 18 of the negotiation process you just mentioned? 19 ATTORNEY BLOCK: Objection to form. 20 A About what negotiation? 21 Q (BY ATTORNEY WEINBERG) You testified that 22 the chatdserver sends the offer ACK back to the 23 caller. 24 And after that happens and the two -- the 25 caller and the callee know that they are now ready</p>

<p style="text-align: right;">Page 118</p> <p>1 to communicate, a negotiation process begins wherein 2 the caller and callee negotiate the relay and 3 bandwidth parameters. 4 I would like to understand, if you could 5 explain to me, what that negotiation entails. 6 ATTORNEY BLOCK: Objection to form; 7 misstates. 8 A So this negotiation, the relay 9 negotiation, starts by every -- both caller and 10 callee probing -- reaching all the relays in the 11 list of relays that were distributed by the chat 12 server. 13 Q (BY ATTORNEY WEINBERG) Sorry. Say that 14 again. 15 A So both caller and callee will attempt 16 connecting to every relay in the list of relays that 17 they both -- they were both given by the signaling 18 server. 19 Q Okay. What's next? 20 A This process is done not just by the 21 IP address, but also by an authorization token that 22 is unique to the call. So both caller and callee 23 will be passed a unique authorization token to use 24 only those specific relays. 25 And using the token, both the caller and</p>	<p style="text-align: right;">Page 119</p> <p>1 callee attempt to connect to every relay in that 2 list using the authorization token. 3 Q Okay. So to rephrase what you said, the 4 chatdserver provides a list to the two clients of 5 relay servers and provides them authentication 6 credentials, and each one tries to connect to the -- 7 to all of the relay servers provided to them by the 8 chatdserver? 9 A Authorization token. 10 ATTORNEY BLOCK: Objection to the form; 11 misstates. 12 A Authorization token. It's only 13 authorization. It's not authentication. 14 Q (BY ATTORNEY WEINBERG) Okay. Tell me -- 15 what is that authorization token? 16 A So the relay server is designed in a way 17 that it does not perform advanced authentication of 18 the devices that send data to it. 19 It operates at a lower security level 20 where the only thing that it does is validates an 21 authorization token that has a low expiration time. 22 So as long as you have a valid token, you 23 can use the relay. So that is authorization for 24 authentication, but we don't -- we don't 25 authenticate the users of the relay.</p>
<p style="text-align: right;">Page 120</p> <p>1 Q (BY ATTORNEY WEINBERG) Okay. What is the 2 purpose of trying to connect to all those relays? 3 A The purpose of connecting to the relays is 4 firstly to see which one is available; and second, 5 to measure the latency to each of them. 6 Q Let me ask: How does the chatdserver 7 decide which relay servers to give to these two 8 clients? 9 ATTORNEY BLOCK: Object to form. 10 A The decision to pick -- to select the list 11 of relays is based on latency measurements. And the 12 information that it uses is the caller IP address 13 and the last seen IP of the callee. 14 The algorithm that we used at that time 15 was essentially to find the top three of each -- 16 based on each IP address, and we merged the list so 17 that the sum of the latency is -- is the lowest. 18 So we choose the top lowest latency sum in 19 that merged list of the relays, and that's the one 20 that we delivered to both of them. 21 Q (BY ATTORNEY WEINBERG) Okay. So the 22 chatdserver chooses which relay servers the clients 23 should attempt to connect to? 24 ATTORNEY BLOCK: Object to form. 25 Q (BY ATTORNEY WEINBERG) I think you just</p>	<p style="text-align: right;">Page 121</p> <p>1 got done saying that? 2 A Yes, the chatdservers decide that. Yes. 3 Q Okay. And then there's a second choice, 4 evidently, that you talked about just before this 5 where the clients connect to this list of relay 6 servers and then they -- each one decides which one 7 of the connections to then use; is that -- 8 A I think it's a little confusing -- there's 9 some confusion in there, so let me clarify. 10 Q Sure. 11 A Both the server -- both the signaling 12 server and the clients make a decision in this 13 process. It's a hybrid decision. 14 So the server picks the top five, let's 15 say, or three. But in the end, each client picks 16 its own, like, relay to use, and that's just one. 17 But the client decides that based on the short list. 18 Q Do the two clients have to agree on a 19 specific relay server to use? 20 A They don't. The -- the network paths are 21 completely asynchronous and, like, they don't need 22 to be the same. 23 So the packets -- if I initiate a voice 24 video call to you, the packets that I sent to you 25 don't need to take the same network path that</p>

<p style="text-align: right;">Page 122</p> <p>1 you sent -- the packets that you sent to me.</p> <p>2 They're separate.</p> <p>3 However, in most cases they'll use a</p> <p>4 similar network path, but that's just statistics.</p> <p>5 Q All right. And they make that choice</p> <p>6 based on performance considerations, I assume?</p> <p>7 A Yes.</p> <p>8 Q All right. What's an example of the</p> <p>9 performance considerations?</p> <p>10 A What do you mean by "performance</p> <p>11 consideration"?</p> <p>12 Q The client chooses a relay server based on</p> <p>13 which server provides it the best performance,</p> <p>14 generally speaking, correct?</p> <p>15 ATTORNEY BLOCK: Object to form.</p> <p>16 A The best latency.</p> <p>17 Q (BY ATTORNEY WEINBERG) The best latency.</p> <p>18 So what is the definition of "latency"?</p> <p>19 A It's a roundtrip time between the client</p> <p>20 device and the edge location or the relay.</p> <p>21 Q Okay. So now the connection between the</p> <p>22 clients and the relay server, is there a protocol</p> <p>23 for establishing that connection?</p> <p>24 A Yes.</p> <p>25 Q And what protocol is that?</p>	<p style="text-align: right;">Page 123</p> <p>1 A It's a custom STUN protocol.</p> <p>2 Q STUN?</p> <p>3 A STUN, S-T-U-N.</p> <p>4 Q STUN?</p> <p>5 A It is a -- STUN is a -- it's a protocol</p> <p>6 format. So the messages are -- are using the STUN</p> <p>7 headers, but the protocol itself is designed by</p> <p>8 WhatsApp. It's proprietary.</p> <p>9 Q What do you mean by the -- which part of</p> <p>10 it is proprietary and which part of it's not</p> <p>11 proprietary?</p> <p>12 ATTORNEY BLOCK: Objection to form.</p> <p>13 A So for instance, the headers are standard.</p> <p>14 They're part of the STUN message format.</p> <p>15 But the payload inside the STUN messages</p> <p>16 is customized for the face -- for the WhatsApp</p> <p>17 network, particularly with regards to encryption.</p> <p>18 Q (BY ATTORNEY WEINBERG) What sorts of data</p> <p>19 is in the payload of these STUN protocol messages?</p> <p>20 A The most important piece of information</p> <p>21 that is sent in the payload, it's the authorization</p> <p>22 token that I mentioned before, which is a preshared</p> <p>23 key ex -- preshared key encryption mechanism that</p> <p>24 has built-in expiration.</p> <p>25 Q So explain that to me. You said earlier</p>
<p style="text-align: right;">Page 124</p> <p>1 that the authentication token or --</p> <p>2 A Authorization token.</p> <p>3 Q -- authorization token is different -- is</p> <p>4 not authentication.</p> <p>5 So could you help me understand the</p> <p>6 difference between these two things? I could draw</p> <p>7 an analogy, but maybe you can as well.</p> <p>8 ATTORNEY BLOCK: Objection to form.</p> <p>9 A Between authorization and authentication?</p> <p>10 Q (BY ATTORNEY WEINBERG) Yeah. Is</p> <p>11 authorization like you have a key and anybody who</p> <p>12 has a key can walk in and authorization, and</p> <p>13 authentication is knowing somebody's identity; is</p> <p>14 that the difference?</p> <p>15 ATTORNEY BLOCK: Object to form.</p> <p>16 A That's one way to characterize it, yes,</p> <p>17 informally.</p> <p>18 Q (BY ATTORNEY WEINBERG) Okay. How would</p> <p>19 you characterize it?</p> <p>20 A So authentication requires a higher level</p> <p>21 of checking. And it involves check -- like,</p> <p>22 verifying the identity of the end -- of the endpoint</p> <p>23 that is trying to connect. Whereas, with</p> <p>24 authorization, as long as you have the token,</p> <p>25 there's no other checks that are being performed.</p>	<p style="text-align: right;">Page 125</p> <p>1 Q Okay. So now that the clients are</p> <p>2 connected to their respective relays, what happens</p> <p>3 next in the protocol?</p> <p>4 A So the clients do probing of the relay</p> <p>5 during this phase of negotiation by sending multiple</p> <p>6 messages and taking a lot of measurements. And the</p> <p>7 next thing that they do is they exchange that data</p> <p>8 between them.</p> <p>9 Q Exchange what data between them?</p> <p>10 A The data -- the latency measurements that</p> <p>11 each party has done.</p> <p>12 Q Okay.</p> <p>13 A That data is exchanged through a stanza</p> <p>14 that is specific. And I don't remember exactly the</p> <p>15 name if the stanza, but it's a specific stanza only</p> <p>16 used for VoIP.</p> <p>17 So the signaling server is again involved</p> <p>18 with proxying this information from the caller to</p> <p>19 the callee and from the callee to the caller. Both</p> <p>20 ways.</p> <p>21 Q Okay. And then what?</p> <p>22 A At that point each -- both the caller and</p> <p>23 the callee knows -- designates a particular relay</p> <p>24 that they will start using.</p> <p>25 And nothing else happens as -- until the</p>

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1 Q Any others?

2 **A Not from what I remember.**

3 Q Okay. So we spoke about the chatdservers

4 and the relay servers. I'll start with the

5 chatdservers.

6 Where were they implemented? The

7 computers that executed the chatd functionality,

8 where were they located?

9 **A They were located in the data centers that**

10 **we just mentioned.**

11 Q Okay. And the relay servers, were they

12 also located in the data centers we just mentioned?

13 **A No.**

14 Q Okay. Where were they located?

15 **A The relay servers were located in the edge**

16 **locations that we talked about earlier.**

17 Q And those edge locations are the 100

18 locations, including the two in California?

19 **A Yes.**

20 Q Okay. In order to access one of these

21 servers, for example, the chatdserver or the relay

22 servers or one of these load balancing servers,

23 there is presumably some kind of either

24 authorization or authentication that occurs? Yes?

25 ATTORNEY BLOCK: Object to form.

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1 **now, not in the edge locations?**

2 Q (BY ATTORNEY WEINBERG) Are the

3 chatdservers in the edge locations?

4 **A No.**

5 Q So then the chatdservers in the data

6 centers?

7 **A In the data centers, which is only load**

8 **balancers in the edge locations.**

9 **And those will not perform authentication**

10 **for the chat traffic. The authentication happens on**

11 **the chat servers inside the data centers.**

12 **And it's based on -- it's a proprietary**

13 **protocol -- it's the noise protocol that essentially**

14 **provides both encryption and authentication at the**

15 **same time.**

16 Q Okay. Tell me about this authentication

17 protocol for accessing the chatdservers.

18 ATTORNEY BLOCK: Object to form.

19 **A What specifically do you want to know**

20 **about it?**

21 Q (BY ATTORNEY WEINBERG) What is the form of

22 the credentials?

23 **A In a simplified way, the credential is**

24 **essentially an identity key that's stored on the**

25 **client device.**

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1 **A Would you want to be more specific with**

2 **regards to, like, what authorization --**

3 Q (BY ATTORNEY WEINBERG) Sure. Let's start

4 with the load balancers. All right.

5 The edge load balancers, when it receives

6 a request, will it process it automatically or will

7 it check for some kind of authorization?

8 ATTORNEY BLOCK: Object to form.

9 **A The edge location, in case of the relay,**

10 **it will check the author -- authorization token in**

11 **the STUN message that is sent by the client.**

12 **And if that token is not valid, it will**

13 **not allow the use of the relay.**

14 Q (BY ATTORNEY WEINBERG) And that's those

15 temporary tokens that don't do authorization -- I'm

16 sorry -- that don't do authentication --

17 **A Exactly.**

18 Q -- but instead do authorization?

19 **A Exactly.**

20 Q And what about the chatdservers? What

21 kind of credentials are required for accessing the

22 functionality implemented by the chatdservers?

23 ATTORNEY BLOCK: Objection to form.

24 **A The chatdservers -- and just to be clear,**

25 **we're talking about the servers in the data centers**

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1 Q And the client passes it along with every

2 request that it makes to the chatdserver?

3 **A It doesn't. It's more complicated.**

4 Q Okay. Tell me --

5 **A It's -- it's part of the handshake -- the**

6 **initial handshake that it does with the chatd. But**

7 **from that point on, it uses a preshared key to -- it**

8 **uses a negotiated shared key to encrypt the rest of**

9 **the traffic.**

10 Q Got it. How are the original credentials

11 obtained?

12 **A The credentials are obtained through the**

13 **registration process to WhatsApp.**

14 Q Okay. And what does WhatsApp then send

15 the user that constitutes these credentials?

16 ATTORNEY BLOCK: Object to form.

17 **A I'm not sure what you mean by "what does**

18 **it send to users."**

19 Q (BY ATTORNEY WEINBERG) When the user needs

20 to authenticate the chatdservers, it needs to

21 provide some kind of authenticating information, so

22 I'm asking: What does WhatsApp provide the client

23 to help it authenticate those requests?

24 ATTORNEY BLOCK: Object to form.

25 **A So in order to validate -- to**

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1 authenticate, the WhatsApp server sends an
2 activation code to verify that the person who
3 initiates the registration process has ownership
4 over the phone number.

5 And it's over SMS. So we'll send the code
6 over SMS. In using that code, the client can finish
7 the registration process. And after that is
8 finished, the credentials are being admitted.

9 But just to be clear, that identity key
10 that I was talking about is never seen by the
11 server. It's the basis of the internal encryption.
12 So the identity key -- identity key is never -- does
13 not -- does never leave the client device.

14 Q I'm not sure that I followed all of that.

15 The identity key is -- how does it arrive
16 at the client device?

17 ATTORNEY BLOCK: Objection to form.

18 A It is generated -- like, it is generated
19 locally by the client device before the registration
20 starts and when someone installs the app on their
21 phone.

22 Q (BY ATTORNEY WEINBERG) So the client
23 creates its own identity key kind of like a private
24 key?

25 ATTORNEY BLOCK: Object to form.

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1 A Yes.

2 Q (BY ATTORNEY WEINBERG) Okay. And that
3 negotiated key is what gets passed to -- from the
4 client to the chatdserver upon each request to the
5 chatdserver?

6 A The shared key not passed. The shared key
7 is only used an encryption key for the -- as a block
8 cipher encryption key for the traffic.

9 And the server uses that shared key to
10 decrypt the -- that payload.

11 Q And that same shared key is used to
12 encrypt it?

13 A By the client, yes.

14 Q Okay.

15 A And this is only metadata, by the way. It
16 does not include, like, the actual content of the
17 messages. That's a different -- a different thing.

18 Q I'm sorry. The key is used to encrypt
19 only metadata?

20 A The -- yes, it's used to encrypt the data
21 that is sent between the client and the server over
22 the Internet so that someone cannot just look at the
23 traffic and understand what the client is talking
24 with the server.

25 Q When that message arrives at the

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1 A You can refer to it as a private key, yes.

2 Q (BY ATTORNEY WEINBERG) Okay. And how does
3 it use that private key to authenticate to the
4 chatdserver?

5 A It is a complex protocol which is part of
6 what noise does, but it's essentially a key to
7 there.

8 So there's a public key and a private key.

9 The public key is what is sent to the server so the
10 server can verify that the client is indeed who --
11 who they claim they are.

12 So there's multiple keys involved. And
13 this protocol is fairly complex. So I'm not an
14 encryption expert, by the way, so I can talk to some
15 aspects of it, but I don't know, like, the -- very
16 little details of, like, how -- how, like -- all the
17 steps involved and all the types of keys. There are
18 multiple keys involved in this process.

19 But the idea is that the identity key is
20 something that -- or the private key does never
21 leave the client device.

22 Q Okay. So client device uses this private
23 key to obtain a negotiated key with a chatdserver
24 for each session?

25 ATTORNEY BLOCK: Object to form.

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1 chatdserver, the server then decrypts it using the
2 same shared key.

3 How does it decide that it's an authentic
4 message?

5 ATTORNEY BLOCK: Object to form.

6 A It would not be able to decrypt the
7 content. And it would not pass all the -- the
8 checks on the -- so the -- basically, the -- there's
9 a verification process that checks whether the --
10 the message was tampered with, it was modified.

11 And it will do all of that upon receipt.
12 The chatdserver will do that before using the
13 payload.

14 Q (BY ATTORNEY WEINBERG) And that's just
15 based on the shared key?

16 A Yes.

17 Q Okay. You told us a moment ago about the
18 server locations for the chat features. And I think
19 that you testified earlier today that the VoIP uses
20 the -- those chat servers.

21 So I just want to confirm that the --
22 those server locations we discussed just now are for
23 the -- are the servers being used for voice over IP.

24 ATTORNEY BLOCK: Object to the form of the
25 question.

<p>Page 206</p> <p>1 A What kind of server?</p> <p>2 Q (BY ATTORNEY WEINBERG) Any server</p> <p>3 physically located in California.</p> <p>4 ATTORNEY BLOCK: Same objection.</p> <p>5 A Any server owned by Facebook?</p> <p>6 Q (BY ATTORNEY WEINBERG) Any server in</p> <p>7 California owned by anybody.</p> <p>8 The question is: Does -- do Plaintiffs</p> <p>9 know about any server physically located in</p> <p>10 California that was specifically targeted by Pegasus</p> <p>11 software?</p> <p>12 ATTORNEY BLOCK: Objection to form.</p> <p>13 A The only thing that I know is that during</p> <p>14 the attack that we observed, there were some servers</p> <p>15 located in the edge locations in the San Jose and</p> <p>16 Los Angeles metro areas that were involved in those</p> <p>17 attacks, relay servers.</p> <p>18 That's the only thing -- the only</p> <p>19 information that I have.</p> <p>20 Q (BY ATTORNEY WEINBERG) Okay. But do</p> <p>21 you --</p> <p>22 ATTORNEY BLOCK: Can we take a short</p> <p>23 break?</p> <p>24 ATTORNEY WEINBERG: Just one second.</p> <p>25 Q (BY ATTORNEY WEINBERG) The relay server</p>	<p>Page 207</p> <p>1 can't be targeted by client requests, right?</p> <p>2 ATTORNEY BLOCK: Object to form.</p> <p>3 Q (BY ATTORNEY WEINBERG) It's -- WhatsApp</p> <p>4 decides to how to route the relay servers -- how to</p> <p>5 write requests to the relay servers?</p> <p>6 ATTORNEY BLOCK: Object to form.</p> <p>7 A So the signaling server picks the relay</p> <p>8 servers from all the available edge locations.</p> <p>9 Q (BY ATTORNEY WEINBERG) And the signaling</p> <p>10 server is programmed by WhatsApp?</p> <p>11 A By -- yes.</p> <p>12 Q And the user can't select the relay server</p> <p>13 to use?</p> <p>14 A The user can select the relay server.</p> <p>15 What the signaling server does is selects</p> <p>16 from the hundred, it selects the top three or five.</p> <p>17 But ultimately any of the clients can</p> <p>18 decide on each -- like, what relay server can you</p> <p>19 use from the set of three or five.</p> <p>20 Q And the relay servers, remind me, are</p> <p>21 located in -- can you confirm that a user cannot</p> <p>22 purposely direct requests at a particular relay</p> <p>23 server?</p> <p>24 ATTORNEY BLOCK: Object to form.</p> <p>25 A That's not entirely correct. So a user</p>
<p>Page 208</p> <p>1 a -- a client is given a lister of relays.</p> <p>2 And as part of the relay negotiation</p> <p>3 process, every client conducts all the relays they</p> <p>4 were given. But ultimately, the data packets that</p> <p>5 are being sent is up in the decision of each client.</p> <p>6 So they decide on their own which relay server to</p> <p>7 use.</p> <p>8 Q (BY ATTORNEY WEINBERG) Okay.</p> <p>9 ATTORNEY BLOCK: Can we take that short</p> <p>10 break?</p> <p>11 ATTORNEY WEINBERG: Sure.</p> <p>12 THE VIDEOGRAPHER: Off the record at</p> <p>13 4:11 p.m.</p> <p>14 (A break was taken from 4:11 p.m. to</p> <p>15 4:30 p.m.)</p> <p>16 THE VIDEOGRAPHER: We were on the record</p> <p>17 at 4:30 p.m.</p> <p>18 Q (BY ATTORNEY WEINBERG) Thank you.</p> <p>19 So just before we left off you were</p> <p>20 talking about the investigation that WhatsApp</p> <p>21 conducted for -- I guess it's about -- around the</p> <p>22 week of May 2, 2019?</p> <p>23 A What investigation about the attack?</p> <p>24 Q The stanzaming investigation. From what I</p> <p>25 understand, WhatsApp studied traffic for about a</p>	<p>Page 209</p> <p>1 week or so before closing the vulnerability to see</p> <p>2 if they could gain some insight into -- into the</p> <p>3 incident; is that correct?</p> <p>4 ATTORNEY BLOCK: Object to form.</p> <p>5 A Yes, we firstly detected the suspicious</p> <p>6 activity. I don't remember exactly the day. I</p> <p>7 think it was Thursday or Friday.</p> <p>8 And the following Friday -- until the</p> <p>9 following Friday, we did logging of the activity of</p> <p>10 the attack in order to gain an understanding of how</p> <p>11 the attack works.</p> <p>12 ATTORNEY BLOCK: I don't want to interrupt</p> <p>13 you, but I probably should have done it before you</p> <p>14 started. I thought you were going to go there</p> <p>15 first.</p> <p>16 As I mentioned to you off the record,</p> <p>17 during the break Mr. Gheorghe did some rereview of</p> <p>18 some of the prep that he did for his incorporate</p> <p>19 representative topics, including with respect to</p> <p>20 QuadraNet, so I commend to you revisiting those</p> <p>21 topics when you wish to do so.</p> <p>22 ATTORNEY WEINBERG: All right. Thank you.</p> <p>23 Q (BY ATTORNEY WEINBERG) If you could take a</p> <p>24 quick look at 1167. That's Exhibit 1167. It's the</p> <p>25 stanzaming chat. Just at page -- I'll remind you</p>

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1 that at the bottom of page 1, there was this --
 2 actually, I guess, the -- yeah, at the top of page 2
 3 where it says that the suspicious stanza received in
 4 this incident was being sent on May 2, 2019. That's
 5 the second and third line of that.

6 So this instance sort of began it -- on
 7 May 2, 2019, correct?

8 **A Yes.**

9 Q And then if you go down to the next line
 10 where you have got [REDACTED] speak -- writing on
 11 Friday, May 3, at 4:49 a.m., he says:

12 Here is a "diff" -- with the
 13 name of a "diff" -- that will
 14 enforce our servers to only accept
 15 valid stanzas. This could mitigate
 16 the impact, but we would like to
 17 first identify the vulnerability,
 18 if there is, before modifying this.

19 My understanding of the "diff" in this
 20 context is that there's a code change that's
 21 available to push to the server?

22 **A That's exactly right.**

23 Q And once that gets pushed to the server,
 24 it will modify the servers to only accept valid
 25 stanzas; is that correct?

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1 I just want to go through some of them to figure out
 2 which ones of them refer to what and whether there's
 3 repeats and -- just for nomenclature sake.

4 **A Sure.**

5 Q "Server trace logs," what does that
 6 typically refer to in these documents? And I can
 7 show you a document, if you're confused about it,
 8 but server trace logs.

9 **A Refreshing my memory right now, I think
 10 server trace log -- can I see the document? I think
 11 that'll be easier.**

12 Q Sure. It's in 1105, the "stanza
 13 validation project task."

14 Let's see if I can find exactly where. So
 15 May 4, 2019 is page 13 of the document.

16 **A What page? Sorry.**

17 Q Page 13 of the document is -- there's a
 18 comment by Jesus on May 4, 2019. He says:

19 Adding server trace logs for
 20 some number, sending the malicious
 21 stanza.

22 **ATTORNEY BLOCK: Object to form.**

23 Q (BY ATTORNEY WEINBERG) The question is:
 24 What is the trace log?

25 **A The server trace log is a log from the**

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1 **ATTORNEY BLOCK: Object to form.**

2 **A I haven't reviewed that "diff" for, like,
 3 years, so I don't know about all the details in it,
 4 but it's likely a change that enforces the
 5 validation -- like, the blocking -- it does
 6 enforcement for the stanza validation --**

7 Q (BY ATTORNEY WEINBERG) Got it.

8 **A -- for the signaling server.**

9 Q Understood. And it says:

10 This can mitigate the impact,
 11 but we would like to first identify
 12 the vulnerability, if there is,
 13 before modifying this.

14 And so what he is saying there is: Hey,
 15 let's not push this valid -- this enforcement out to
 16 the server just yet; let's leave it open for a
 17 while, observe some traffic, and see what we can
 18 learn about this incident?

19 Is that what you guys ended up doing?

20 **A Yes. That is -- and by the way, this is
 21 an industry standard practice. We're not -- like,
 22 we're just following the process, basically.**

23 Q I see.

24 So going through all these materials,
 25 there were a lot of logs with different names. And

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1 chat server about -- at different points in handling
 2 stanzas.

3 **So once the trace log -- it's a tool.**

4 **It's an internal tool where we would, for a
 5 particular number, enable trace logs. And we
 6 would -- once that's enabled, we would see in
 7 realtime all the activity from that number
 8 throughout the chat servers.**

9 Q Did you also have server trace logs for
 10 the relay servers?

11 **A Those are called differently. Those are
 12 called EdgeRay logs.**

13 Q EdgeRay logs.

14 And what kind of information is contained
 15 in the EdgeRay log?

16 **A In the EdgeRay log, we did some custom
 17 logging regarding the source IP of the packet, the
 18 destination IP, the size of the packet, and the
 19 content of the packet, I believe.**

20 **We were changing that logging format quite
 21 a lot, so I don't know off the top of my head, like,
 22 all the fields that we were logging.**

23 **But at a high level, that's -- those are
 24 the ones that I remember right now.**

25 Q Okay. Validation log?

<p style="text-align: right;">Page 254</p> <p>1 of the objects of using Pegasus was to read 2 information from the phone, including chat logs. 3 I'm asking if you're aware of the Pegasus 4 software deleting those logs. 5 A I'm not aware of a deletion. 6 ATTORNEY BLOCK: And the same objections 7 to that question. 8 Q (BY ATTORNEY WEINBERG) Are you aware of 9 Pegasus offering -- altering those logs? 10 ATTORNEY BLOCK: Same objections. Vague. 11 A I'm not aware. 12 Q (BY ATTORNEY WEINBERG) Does WhatsApp own 13 those logs? 14 ATTORNEY BLOCK: Objection to form and 15 scope. 16 A I'm not an expert into, like, the Terms of 17 Service and what data WhatsApp owns and what not, so 18 I don't -- I cannot speak to that. 19 Q (BY ATTORNEY WEINBERG) Do you have any 20 evidence that Pegasus prevented WhatsApp from 21 accessing the client devices as it normally would? 22 I think you testified earlier that 23 WhatsApp was able to send messages to the client 24 devices, pull logs, that kind of thing? 25 ATTORNEY BLOCK: Object to form;</p>	<p style="text-align: right;">Page 255</p> <p>1 misstates. 2 Q (BY ATTORNEY WEINBERG) I'll rephrase my 3 question. 4 Do you have any evidence that Pegasus 5 prevented WhatsApp from accessing the client logs -- 6 devices as it normally would? 7 ATTORNEY BLOCK: Objection to form. 8 A I'm not aware of any information related 9 to this. 10 Q (BY ATTORNEY WEINBERG) Do you have any 11 evidence that Pegasus prevented WhatsApp users from 12 using their -- the WhatsApp service? 13 ATTORNEY BLOCK: I object to form and 14 scope, partial. 15 A What was the question again? 16 Q (BY ATTORNEY WEINBERG) Do you have any 17 evidence that Pegasus prevented -- I'm sorry. 18 ATTORNEY WEINBERG: Would you read back 19 the question for me? 20 (The court reporter read back the 21 following testimony: 22 Do you have any evidence that 23 Pegasus prevented WhatsApp users 24 from using their -- the WhatsApp 25 service?)</p>
<p style="text-align: right;">Page 256</p> <p>1 ATTORNEY BLOCK: Same objections. 2 A What do you mean by "the WhatsApp service" 3 in this case? 4 Q (BY ATTORNEY WEINBERG) WhatsApp provided a 5 VoIP service that allowed users to make telephone 6 calls and video calls, and that's the service I'm 7 referring to. 8 ATTORNEY BLOCK: Same objections. 9 A So I'm -- I'm a little confused by this 10 question. Like, I don't understand, like, how -- 11 like, how would Pegasus not allow users to use VoIP 12 and not allow access to VoIP services? 13 Q (BY ATTORNEY WEINBERG) I guess I'm not 14 sure about your clarification question there. 15 You could imagine that you get some sort 16 of virus on your phone which prevents you from 17 making phone calls using WhatsApp. Right? 18 Did Pegasus do that? 19 A I don't have any information about that. 20 Q Just generally, did Pegasus cause 21 WhatsApp's service to break? That's -- 22 ATTORNEY BLOCK: Objection to form. 23 A Cause to break? 24 I would say yes. Because normally, like, 25 in a regular -- like, if you see -- if you see</p>	<p style="text-align: right;">Page 257</p> <p>1 this -- the attack from the point of view of the 2 victim, like, if you receive some messages from the 3 server that are passed and those servers are 4 supposed to be sent by a legitimate client and they 5 all seem -- they were supposed to be doing not what 6 -- what they were doing. 7 So in our -- the way we think about it in 8 this trust model, the server is a trusted entity, 9 and it was -- so basically this attack made the 10 server forward some messages that would normally not 11 be sent by a regular client. 12 So that -- that actually -- I think I 13 would say that breaks the WhatsApp service. 14 Q (BY ATTORNEY WEINBERG) I didn't mean in a 15 metaphysical way. I meant in a technological way, 16 WhatsApp's VoIP service was still accessible to any 17 user that -- 18 A In a technological way, they were causing 19 crashes. So their -- the victim's application would 20 crash in many of the cases of the attack. 21 I think that is very clear evidence that 22 in a technological way, they were impairing our 23 service. 24 Q So the extent of the impaired service 25 would be that during a failed installation,</p>

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1 sometimes there would be a crash?
 2 ATTORNEY BLOCK: Object to form; misstates
 3 testimony.
 4 **A I think that's one evidence how they were**
 5 **impairing the service, but that was just an example,**
 6 **but...**
 7 Q (BY ATTORNEY WEINBERG) Well, impairing the
 8 trust in the service might be a different category.
 9 I'm just kind of speaking from a technical
 10 perspective.
 11 Did the service still provide voice
 12 services which allowed WhatsApp users to communicate
 13 with one another across long distances?
 14 ATTORNEY BLOCK: I object to the preamble
 15 of the question, and I object to the form of the
 16 question that followed. And --
 17 **A Just to --**
 18 ATTORNEY BLOCK: -- it --
 19 **A -- be clear, I'm using "trust" here in a**
 20 **very technical manner. Trust is an important aspect**
 21 **of designing secure systems.**
 22 **And like, having a trust model in your**
 23 **system influences a lot, like, the security of the**
 24 **system. So I'm not using it in a metaphorical sense**
 25 **or in any way. Trust is a big -- an important part**

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1 out to the Internet? Because I'm
 2 seeing actual commands with
 3 malicious C2s in the payloads
 4 between test numbers.
 5 And then YuanYuan Wang responds, and
 6 afterwards Andrew Stephen Robinson responds:
 7 My concern is that you popped
 8 yourselves.
 9 What do you understand to be this concern
 10 about the researchers here, quote, popping
 11 themselves? What does that mean?
 12 ATTORNEY BLOCK: I'll object to having
 13 omitted YuanYuan's statement in your preamble. And
 14 I object to scope.
 15 But you can answer, to the extent you
 16 understand.
 17 **A Where is the comment that says "popping**
 18 **themselves"?**
 19 Q (BY ATTORNEY WEINBERG) It's at -- the
 20 comment at 13:47:43. It says:
 21 My concern is you popped
 22 yourselves.
 23 **A Yeah, so I think I know what's going on**
 24 **here.**
 25 **As part of the investigation, we were**

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1 of how you design secure systems. It's the trust
2 model of your system.
 3 ATTORNEY WEINBERG: All right. Can we
 4 take a short break? Is that all right with you
 5 guys?
 6 ATTORNEY BLOCK: Yeah.
 7 THE VIDEOGRAPHER: 6:02 p.m.
 8 (A break was taken from 6:02 p.m. to
 9 6:19 p.m.)
 10 THE VIDEOGRAPHER: We are on the record at
 11 6:19 p.m.
 12 Q (BY ATTORNEY WEINBERG) All right. Do we
 13 have Exhibit 1106 out already? I would like to
 14 direct your attention to page 7 of this.
 15 **A Would you confirm the number at the**
 16 **bottom?**
 17 Q Yeah. It's 115245.
 18 **A All right.**
 19 Q There's an exchange here where Andrew
 20 Stephen Robinson writes at 13:44:15, the time -- he
 21 says:
 22 So digging through the logs
 23 for testing you guys -- for
 24 testing, are you guys using
 25 emulated devices which can't reach

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1 trying to repo to see how the attack works. And as
2 part of that, some of the engineers would take one
3 of the malicious payloads that we found, and they
4 would essentially try to put that in their test
5 devices and tried to simulate how the exploit works.
 6 **And Andrew Robinson is concerned here**
 7 **because "popping themselves" means that they would**
 8 **actually execute the malicious code on their test**
 9 **devices that would essentially infect them and**
 10 **successfully contact the C2 servers.**
 11 **And that is a breach -- "popping**
 12 **themselves" in this context means that you have**
 13 **breached -- like, you let the attacker that you**
 14 **found out about them.**
 15 **So it would -- would completely compromise**
 16 **the investigation in that case, so we had to operate**
 17 **at a very silent level where we couldn't let the**
 18 **attacker know at all that we found out about this**
 19 **attack in any means -- by any means.**
 20 **And I think that's what he means by**
 21 **"popping themselves" in this case. Like, reveal to**
 22 **the attacker that we found the malicious payload.**
 23 Q And so in these instances, some engineers
 24 were executing the suspicious offer stanzas --
 25 **A On their own devices.**

<p style="text-align: right;">Page 270</p> <p>1 of the C2 servers was located on AW -- was hosted by 2 AWS. And we tried to reach out to AWS to give us 3 whatever they had on that machine that had that IP. 4 I don't know what he means by "payload" in 5 this case. Payload is kind of a generic name, so I 6 don't know what he means by "payload." But that's 7 what I know that we tried to get from AWS. 8 Q (BY ATTORNEY WEINBERG) I would presume 9 that the payload from a C2 server is whatever it is 10 that the C2 server is programmed to deliver to a 11 client, right? 12 ATTORNEY BLOCK: Object to form; calls for 13 speculation. 14 A Yeah, I don't know what he meant. 15 Q (BY ATTORNEY WEINBERG) All right. All 16 right. So just about the fixes then. 17 In this document, do you see on page -- 18 the second page in that same Aby John comment that 19 we just spoke about, it discusses server fixes and 20 client fixes. 21 So can you tell me about the remediation 22 work that WhatsApp did in response to this -- to 23 this incident? 24 A Yeah, I can talk about that. 25 So the remediation -- the immediate</p>	<p style="text-align: right;">Page 271</p> <p>1 remediation of the attack entailed three fixes. Two 2 of them were server side, and one of them -- 3 Q Two server side? 4 A -- two server-side fixes and one client 5 side fix that was rolled out with all the 6 applications, all the platforms that use WhatsApp, 7 the Android, iPhone, whatever. Like, all the 8 phones. 9 Q The client-side fixes were for Android and 10 iPhone? 11 A Yes. It was a cross -- cross-platform 12 fix. It was the same fix that would apply to both 13 platforms. 14 Q Okay. So the vulnerability on the client 15 was both an Android and an iOS exploit? 16 ATTORNEY BLOCK: Object to form. 17 A So the vulnerability was in the C code 18 responsible for handling voice and video calling 19 logic, and it was the same code running on both of 20 these platforms. 21 Q (BY ATTORNEY WEINBERG) Okay. Did WhatsApp 22 have any evidence that any iOS devices were 23 compromised using this vulnerability? 24 A From what I remember, yes, we had some 25 iOS -- some samples of the attacks that were</p>
<p style="text-align: right;">Page 272</p> <p>1 targeting iOS devices, but a majority of the 2 samples, from what I remember, was all Android. 3 Q I'll have you take a look at Exhibit 1119. 4 (Exhibit 1119 was marked for 5 identification and is attached to the transcript.) 6 A Yeah. 7 Q (BY ATTORNEY WEINBERG) Just -- my only 8 questions on this is: This is a WorkChat that you 9 received on May 14, 2019? 10 A Yeah. 11 Q I think that's it. 12 A Okay. 13 Q What was the client-side fix that you 14 talked about? 15 A The client-side fix was preventing the 16 buffer overflow that was used in the remote code 17 execution. 18 So we limited the buffer size sent -- that 19 is sent from the remote end. We limited it to the 20 size of the buffer that we have locally. So after 21 that fix, memory corruption could not occur anymore. 22 Q Was the buffer overflow vulnerability in a 23 piece of third-party software? 24 A No. 25 Q And you -- to roll out this</p>	<p style="text-align: right;">Page 273</p> <p>1 server-side fix -- sorry -- the client-side fix, you 2 rolled out an update to the Android Google store? 3 A The Play Store. 4 Q The Play Store; is that correct? 5 A Yes. 6 ATTORNEY BLOCK: Objection to form. 7 Sorry. Belated. 8 Q (BY ATTORNEY WEINBERG) Did you send the 9 same update to the Apple Store -- App Store? 10 ATTORNEY BLOCK: Objection to form. 11 A Yes, we did. 12 Q (BY ATTORNEY WEINBERG) Tell me about the 13 server-side fixes. 14 A The first fix we rolled out on the server 15 side was for the relay. And we rolled that out on 16 Friday. I don't remember the actual date, that 17 week. 18 Q Okay. So what did you do to the relay 19 server -- 20 A The relay server -- 21 Q -- software? 22 A -- sorry? 23 Q The relay server software. 24 A Yes. So the relay server fix was about 25 limiting the messages that were used, the SRTPSR and</p>

<p style="text-align: right;">Page 274</p> <p>1 RR.</p> <p>2 The messages that were used to do -- to</p> <p>3 exploit the buffer overflow were being kept and</p> <p>4 dropped by the -- by the server. So a normal</p> <p>5 WhatsApp application would not send these really</p> <p>6 large SR and RR SRTP packets. So it was very easy</p> <p>7 for us to identify the ones sent by a malicious --</p> <p>8 by a fake client.</p> <p>9 In this case it was the fake client that</p> <p>10 was attacking the victim, so it was very easy for us</p> <p>11 to basically put some logic in place that would</p> <p>12 basically -- that would just drop those SRTPRR</p> <p>13 messages.</p> <p>14 And as an effect, we observed immediately</p> <p>15 a different behavior in the pattern of the attacks,</p> <p>16 so we knew for sure that -- that we -- we broke</p> <p>17 their exploit.</p> <p>18 It seemed kind of like it was broken, but</p> <p>19 it wasn't clear. It seemed broken, but it wasn't</p> <p>20 clear that we actually found it. And we did it --</p> <p>21 that intentionally to monitor their behavior.</p> <p>22 Q So this change to the relay server</p> <p>23 enhanced the security of the relay server beyond</p> <p>24 what it was before the fix?</p> <p>25 A No, it did not. It was actually a</p>	<p style="text-align: right;">Page 275</p> <p>1 temporary change that we made only for this. We</p> <p>2 pulled it out after we rolled out the client fix.</p> <p>3 We did it just to break their exploit, basically.</p> <p>4 From a protocol perspective, the</p> <p>5 message -- like, you -- it wasn't -- it was just</p> <p>6 very -- something very specific that only those</p> <p>7 clients were sending, so that's why we could do it.</p> <p>8 Q And in that respect, the change to the</p> <p>9 relay server created an additional barrier to -- to</p> <p>10 the exploit that didn't exist before; so it,</p> <p>11 therefore, enhanced the security of the relay server</p> <p>12 beyond what it was?</p> <p>13 A It -- it did not enhance the security of</p> <p>14 the relay server at all. It -- the only reason why</p> <p>15 we put that change is to break that specific</p> <p>16 exploit, yes.</p> <p>17 Q Did the change restore the server to a</p> <p>18 previous condition?</p> <p>19 ATTORNEY BLOCK: Objection to form.</p> <p>20 A Restore the server to a previous</p> <p>21 condition? I'm not sure what that means.</p> <p>22 Q (BY ATTORNEY WEINBERG) The client-side</p> <p>23 vulnerability, I think that's the one that was</p> <p>24 reported in the CVE, right?</p> <p>25 ATTORNEY BLOCK: Object to form.</p>
<p style="text-align: right;">Page 276</p> <p>1 A What CVE?</p> <p>2 Q (BY ATTORNEY WEINBERG) It's this -- the</p> <p>3 number is listed on the White Paper, if you want to</p> <p>4 look at it, but CVE-2019-3568.</p> <p>5 A Can I get that?</p> <p>6 Q And 1148 is the exhibit number.</p> <p>7 ATTORNEY BLOCK: You're looking for --</p> <p>8 A Yeah, got it. 3568. Yes, that's the one.</p> <p>9 Q (BY ATTORNEY WEINBERG) So just for the</p> <p>10 record, you have identified the same CVE number on</p> <p>11 the CVE list at Exhibit 1163?</p> <p>12 A Yes.</p> <p>13 Q So this says that the buffer overflow --</p> <p>14 I'm looking at Exhibit 1163 at page 4. And I am</p> <p>15 looking at the entry here for CVE-2019-3568.</p> <p>16 And that's the vulnerability that was</p> <p>17 closed with the client-side fix, right?</p> <p>18 A Yes.</p> <p>19 Q So this is -- the description of that</p> <p>20 vulnerability, it says:</p> <p>21 A buffer overflow</p> <p>22 vulnerability in WhatsApp VoIP</p> <p>23 stack allowed remote code execution</p> <p>24 via a specially crafted series of</p> <p>25 RTCP packets sent to a target phone</p>	<p style="text-align: right;">Page 277</p> <p>1 number. The issue affects WhatsApp</p> <p>2 for Android prior to</p> <p>3 Version 2.19.134, WhatsApp Business</p> <p>4 for Android prior to</p> <p>5 Version 2.19.44, WhatsApp for iOS</p> <p>6 prior to Version 2.19.51, and so</p> <p>7 on.</p> <p>8 All right. So this only refers to the</p> <p>9 client-side vulnerability, right? And this -- this</p> <p>10 CVE refers to the client-side vulnerability?</p> <p>11 ATTORNEY BLOCK: Object to form.</p> <p>12 A Yes.</p> <p>13 Q (BY ATTORNEY WEINBERG) And that</p> <p>14 vulnerability existed in WhatsApp's code as WhatsApp</p> <p>15 wrote the code, right?</p> <p>16 ATTORNEY BLOCK: Objection to form.</p> <p>17 A So the way -- the way I look at the</p> <p>18 vulnerability is it's a -- the vulnerability exists</p> <p>19 in the moment when you have an attack that exploits</p> <p>20 it.</p> <p>21 Q (BY ATTORNEY WEINBERG) I don't know if</p> <p>22 that's right. What's the difference between a</p> <p>23 vulnerability and an exploit?</p> <p>24 ATTORNEY BLOCK: Objection to form; scope.</p> <p>25 Q (BY ATTORNEY WEINBERG) Isn't it the case</p>

<p style="text-align: right;">Page 278</p> <p>1 that a vulnerability is a potential for 2 exploitation, and an exploit is when the 3 vulnerability is actually exploited? 4 ATTORNEY BLOCK: Objection to form; and 5 scope. 6 A So the way I see a vulnerability is in -- 7 like, that exists in the moment you have an attack 8 that -- that uses it. 9 Q (BY ATTORNEY WEINBERG) Don't you have a 10 vulnerability the moment you write a code that has a 11 vulnerability? 12 Like, if I make a fence and the fence has 13 a gap in it, the fence has a vulnerability. And if 14 somebody walks through that fence -- that gap in the 15 fence, that's -- that's an exploit of the 16 vulnerability? 17 A No, I don't -- 18 ATTORNEY BLOCK: Object to -- sorry. 19 Objection to form; scope; vagueness; incomplete 20 hypothetical, et cetera. 21 A -- yeah, I don't agree with that. 22 So software has virtually, like, always 23 some flaws in it. 24 Q (BY ATTORNEY WEINBERG) What would you call 25 those flaws?</p>	<p style="text-align: right;">Page 279</p> <p>1 ATTORNEY BLOCK: Huh? 2 A They're just flaws. The moment you build 3 an attack -- 4 ATTORNEY BLOCK: Can you just let the 5 witness finish his answer before you interrupt? 6 ATTORNEY WEINBERG: He paused. 7 Q (BY ATTORNEY WEINBERG) Go ahead. 8 A So there's always going to be flaws in -- 9 in the software. Like, it's always there. There's 10 always -- any software that exists today has some 11 flaws in it. 12 The moment that becomes a vulnerability 13 and becomes relevant is when someone is able to 14 exploit it and have an attack that uses it. 15 Until then, it's -- it's just software. 16 Q (BY ATTORNEY WEINBERG) Okay. I think we 17 are just having a semantic discussion. So we want 18 to call the hole in the software that is 19 exploitable, a flaw? 20 ATTORNEY BLOCK: Objection to form. 21 A I think a vulnerability is -- is a flaw. 22 My point is that an attack is the one that validates 23 that you can use that flaw to do something bad with 24 it. 25 Q (BY ATTORNEY WEINBERG) And I guess my only</p>
<p style="text-align: right;">Page 280</p> <p>1 question is that: That flaw existed in WhatsApp's 2 software as WhatsApp wrote it, right? It wasn't 3 created by anybody else? 4 ATTORNEY BLOCK: Objection to form. 5 A So we -- we wrote the software for the 6 VoIP stack having in mind all the -- like, we 7 designed it and we wrote it, assuming that the 8 messages being sent are a part of the WhatsApp 9 network and that they're official clients built by 10 the WhatsApp team. 11 So with that regards, there was no flaw. 12 Voice calling was working perfectly fine. 13 Q (BY ATTORNEY WEINBERG) Nobody changed 14 WhatsApp's code, right? 15 ATTORNEY BLOCK: Object to form. 16 Q (BY ATTORNEY WEINBERG) No -- pegasus 17 didn't change WhatsApp's code, correct? 18 A I -- 19 ATTORNEY BLOCK: Object to form and scope. 20 A -- I actually don't agree with that. 21 Because they changed the memory layout of the 22 application and they actually did change the 23 WhatsApp code. 24 They made the -- 25 Q (BY ATTORNEY WEINBERG) On the client?</p>	<p style="text-align: right;">Page 281</p> <p>1 A -- on the client, yes. They changed the 2 WhatsApp client on -- they changed the WhatsApp code 3 running on the victim's phone. 4 Q But the flaw or vulnerability they used to 5 do that, which is the vulnerability disclosed at 6 CVE-2019-3568, was a vulnerability that existed in 7 WhatsApp's code as WhatsApp had released it? 8 ATTORNEY BLOCK: Objection to form. It's 9 asked and answered. And I think it's time to move 10 on. 11 ATTORNEY WEINBERG: All right. Let's go 12 off the record for a bit. 13 THE VIDEOGRAPHER: It's 6:59 p.m. 14 (A break was taken from 6:59 p.m. to 15 7:06 p.m.) 16 THE VIDEOGRAPHER: Back on the record at 17 7:06 p.m. 18 Q (BY ATTORNEY WEINBERG) All right. You 19 said that there were two server changes that were 20 precipitated by this. The first one was this relay 21 server change. 22 What was the second? 23 A The second fix was on the signaling server 24 that enforced the validation of the stanza -- of the 25 offer stanzas and dropped them.</p>

EXHIBIT 15

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment

Document Produced in Native Format

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f01f:0011:face:0000:000d:0000","2401:db00:f034:0001:face:0000:0027:0000"]	["cdt1","mba1"]	["fnedge247.01.cdt1.facebook.com","fnedge020.01.mba1.facebook.com"]	["Paris, FR","Mombasa, KE"]	
			["2401:db00:f013:4016:face:0000:0011:0000","2401:db00:f012:2002:face:0000:001f:0000"]	["dfw5","lga3"]	["fnedge527.02.dfw5.facebook.com","fnedge559.01.lga3.facebook.com"]	["Dallas, Texas, US","New York, NY, US"]	
			["2401:db00:f030:0007:face:0000:0003:0000","2401:db00:f01b:100b:face:0000:001d:0000"]	["maa2"]	["fnedge141.01.maa2.facebook.com","2401:db00:f01b:100b:face:0:1d:0"]	["Chennai, India","unknown"]	
			["2401:db00:f013:1018:face:0000:001b:0000","2401:db00:f013:100c:face:0000:0013:0000"]	["dfw5"]	["fnedge454.01.dfw5.facebook.com","fnedge150.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f00b:2011:face:0000:001b:0000"]	["ort2"]	["fnedge238.02.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f012:200a:face:0000:0005:0000"]	["lga3"]	["fnedge819.01.lga3.facebook.com"]	["New York, NY, US"]	
			["2401:db00:f00b:2004:face:0000:0019:0000","2401:db00:f00b:2007:face:0000:000f:0000","2401:db00:f00d:2006:face:0000:0013:0000"]	["ort2","lax3"]	["fnedge364.02.ort2.facebook.com","fnedge504.02.ort2.facebook.com","fnedge050.02.lax3.facebook.com"]	["Chicago, IL, US","Los Angeles, CA, US"]	
			["2401:db00:f01f:0001:face:0000:0019:0000","2401:db00:f01f:1014:face:0000:000d:0000"]	["cdt1","cdg2"]	["fnedge013.01.cdt1.facebook.com","fnedge662.01.cdg2.facebook.com"]	["Paris, FR"]	
			["2401:db00:f036:0001:face:0000:0003:0000","2401:db00:f036:0002:face:0000:0027:0000"]	["dus1"]	["fnedge014.01.dus1.facebook.com","fnedge080.01.dus1.facebook.com"]	["Dusseldorf, DE"]	
			["2401:db00:f01b:0008:face:0000:0019:0000","2401:db00:f006:1016:face:0000:0027:0000"]	["amt2","mrs2"]	["fnedge192.01.amt2.facebook.com","fnedge412.01.mrs2.facebook.com"]	["Amsterdam, NL","Marseille, FR"]	
			["2401:db00:f01c:0001:face:0000:001f:0000"]	["frx5"]	["fnedge481.01.frx5.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f02a:0008:face:0000:0027:0000"]	["bom1"]	["fnedge206.01.bom1.facebook.com"]	["Bombay, IN"]	
			["2401:db00:f01b:1010:face:0000:0013:0000","2401:db00:f01b:0004:face:0000:0007:0000"]	["amt2"]	["2401:db00:f01b:1010:face:0:13:0","fnedge042.01.amt2.facebook.com"]	["unknown","Amsterdam, NL"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f00b:200e:face:0000:001f:0000","2401:db00:f033:0005:face:0000:0027:0000"]	["ort2","msp1"]	["fnedge300.02.ort2.facebook.com","fnedge112.01.msp1.facebook.com"]	["Chicago, IL, US","Minneapolis, MN, US"]	
			["2401:db00:f00b:200c:face:0000:0001:0000","2401:db00:f013:1013:face:0000:000d:0000"]	["ort2","dfw5"]	["fnedge518.02.ort2.facebook.com","fnedge468.01.dfw5.facebook.com"]	["Chicago, IL, US","Dallas, Texas, US"]	
			["2401:db00:f01b:0012:face:0000:0017:0000"]	["amt2"]	["fnedge293.01.amt2.facebook.com"]	["Amsterdam, NL"]	
			["2401:db00:f006:2008:face:0000:0015:0000","2401:db00:f006:2007:face:0000:001f:0000"]	["mrs2"]	["fnedge008.02.mrs2.facebook.com","fnedge046.02.mrs2.facebook.com"]	["Marseille, FR"]	
			["2401:db00:f00b:0005:face:0000:000b:0000","2401:db00:f00b:0006:face:0000:0027:0000"]	["ort2"]	["fnedge433.01.ort2.facebook.com","fnedge453.01.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f00d:0012:face:0000:0027:0000","2401:db00:f00b:2009:face:0000:0015:0000"]	["lax3","ort2"]	["fnedge764.01.lax3.facebook.com","fnedge555.02.ort2.facebook.com"]	["Los Angeles, CA, US","Chicago, IL, US"]	
			["2401:db00:f013:4013:face:0000:0007:0000","2401:db00:f000:300f:face:0000:0023:0000"]	["dfw5","mia3"]	["fnedge764.02.dfw5.facebook.com","fnedge664.02.mia3.facebook.com"]	["Dallas, Texas, US","Miami, Florida, US"]	
			["2401:db00:f01b:100c:face:0000:001b:0000"]		["2401:db00:f01b:100c:face:0:1b:0"]	["unknown"]	
			["2401:db00:f033:0002:face:0000:0003:0000","2401:db00:f003:1013:face:0000:0013:0000"]	["msp1","iad3"]	["fnedge023.01.msp1.facebook.com","fnedge679.01.iad3.facebook.com"]	["Minneapolis, MN, US","Washington, DC, US"]	
			["2401:db00:f01b:1008:face:0000:001d:0000"]		["2401:db00:f01b:1008:face:0:1d:0"]	["unknown"]	
			["2401:db00:f00b:0010:face:0000:001f:0000"]	["ort2"]	["fnedge329.01.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f013:400d:face:0000:0005:0000","2401:db00:f013:1007:face:0000:0021:0000"]	["dfw5"]	["fnedge605.02.dfw5.facebook.com","fnedge420.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01c:0003:face:0000:0001:0000","2401:db00:f01c:000f:face:0000:0021:0000"]	["frx5"]	["fnedge280.01.frx5.facebook.com","fnedge077.01.frx5.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f013:1015:face:0000:001b:0000"]	["dfw5"]	["fnedge278.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f00d:2008:face:0000:001b:0000", "2401:db00:f00b:0009:face:0000:001b:0000"]	["lax3", "ort2"]	["fledge147.02.lax3.facebook.com", "fledge257.01.ort2.facebook.com"]	["Los Angeles, CA, US", "Chicago, IL, US"]	
			["2401:db00:f00b:2010:face:0000:0009:0000"]	["ort2"]	["fledge344.02.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f01c:0013:face:0000:0027:0000", "2401:db00:f030:1006:face:0000:001f:0000"]	["frx5", "maa2"]	["fledge590.01.frx5.facebook.com", "fledge166.02.maa2.facebook.com"]	["Frankfurt, DE", "Chennai, India"]	
			["2401:db00:f01b:0010:face:0000:0005:0000", "2401:db00:f01b:0011:face:0000:0019:0000"]	["amt2"]	["fledge290.01.amt2.facebook.com", "fledge244.01.amt2.facebook.com"]	["Amsterdam, NL"]	
			["2401:db00:f030:1006:face:0000:0019:0000", "2401:db00:f01b:100f:face:0000:0005:0000"]	["maa2"]	["fledge167.02.maa2.facebook.com", "2401:db00:f01b:100f:face:0:5:0"]	["Chennai, India", "unknown"]	
			["2401:db00:f013:4015:face:0000:0001:0000"]	["dfw5"]	["fledge501.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01c:200a:face:0000:0017:0000"]	["frt3"]	["fledge538.01.frt3.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f01a:100e:face:0000:0011:0000", "2401:db00:f01a:1004:face:0000:0013:0000", "2401:db00:f01a:1008:face:0000:0005:0000"]	["lhr3"]	["fledge184.01.lhr3.facebook.com", "fledge110.01.lhr3.facebook.com", "fledge206.01.lhr3.facebook.com"]	["London, UK"]	
			["2401:db00:f01b:0007:face:0000:000b:0000", "2401:db00:f01b:0010:face:0000:0017:0000"]	["amt2"]	["fledge208.01.amt2.facebook.com", "fledge213.01.amt2.facebook.com"]	["Amsterdam, NL"]	
			["2401:db00:f01a:100e:face:0000:0025:0000", "2401:db00:f01b:100b:face:0000:0007:0000", "2401:db00:f023:0009:face:0000:0025:0000"]	["lhr3", "jnb1"]	["fledge246.01.lhr3.facebook.com", "2401:db00:f01b:100b:face:0:7:0", "fledge172.01.jnb1.facebook.com"]	["London, UK", "unknown", "Johannesburg, ZA"]	
			["2401:db00:f02a:0010:face:0000:0015:0000"]	["bom1"]	["fledge389.01.bom1.facebook.com"]	["Bombay, IN"]	
			["2401:db00:f02a:000e:face:0000:0019:0000", "2401:db00:f02a:000e:face:0000:0007:0000"]	["bom1"]	["fledge212.01.bom1.facebook.com", "fledge416.01.bom1.facebook.com"]	["Bombay, IN"]	
			["2401:db00:f02f:0005:face:0000:000d:0000"]	["ber1"]	["fledge113.01.ber1.facebook.com"]	["Berlin, DE"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f01b:100e:face:0000:0015:0000", "2401:db00:f01a:200b:face:0000:001b:0000", "2401:db00:f01a:2007:face:0000:0019:0000"]	["lht6"]	["2401:db00:f01b:100e:face:0:15:0", "fledge454.01.lht6.facebook.com", "fledge005.01.lht6.facebook.com"]	["unknown", "London, UK"]	
			["2401:db00:f008:1001:face:0000:0017:0000", "2401:db00:f01b:000b:face:0000:000f:0000", "2401:db00:f01b:0002:face:0000:0021:0000", "2401:db00:f006:100e:face:0000:0007:0000", "2401:db00:f01b:0004:face:0000:001f:0000", "2401:db00:f01b:0001:face:0000:0025:0000"]	["mxp1", "mrs2", "amt2"]	["fledge419.01.mxp1.facebook.com", "fledge304.01.amt2.facebook.com", "fledge039.01.amt2.facebook.com", "fledge289.01.mrs2.facebook.com", "fledge167.01.amt2.facebook.com", "fledge268.01.amt2.facebook.com"]	["Milano, IT", "Amsterdam, NL", "Marseille, FR"]	
			["2401:db00:f02f:0005:face:0000:000b:0000", "2401:db00:f009:1002:face:0000:0025:0000"]	["ber1", "arn2"]	["fledge110.01.ber1.facebook.com", "fledge030.02.arn2.facebook.com"]	["Berlin, DE", "Stockholm, SE"]	
			["2401:db00:f01c:2009:face:0000:0005:0000", "2401:db00:f01b:0006:face:0000:001d:0000", "2401:db00:f01b:000b:face:0000:0027:0000", "2401:db00:f004:100d:face:0000:0003:0000"]	["frt3", "amt2", "mad1"]	["fledge489.01.frt3.facebook.com", "fledge227.01.amt2.facebook.com", "fledge071.01.amt2.facebook.com", "fledge885.01.mad1.facebook.com"]	["Frankfurt, DE", "Amsterdam, NL", "Madrid, ES"]	
			["2401:db00:f02a:0007:face:0000:0027:0000", "2401:db00:f01c:0015:face:0000:0015:0000", "2401:db00:f01c:0004:face:0000:0013:0000"]	["bom1", "frx5"]	["fledge051.01.bom1.facebook.com", "fledge518.01.frx5.facebook.com", "fledge159.01.frx5.facebook.com"]	["Bombay, IN", "Frankfurt, DE"]	
			["2401:db00:f01b:1010:face:0000:0001:0000", "2401:db00:f01b:100b:face:0000:0011:0000"]		["2401:db00:f01b:1010:face:0:1:0", "2401:db00:f01b:100b:face:0:11:0"]	["unknown"]	
			["2401:db00:f00d:2008:face:0000:0015:0000", "2401:db00:f00b:000a:face:0000:000b:0000"]	["lax3", "ort2"]	["fledge058.02.lax3.facebook.com", "fledge524.01.ort2.facebook.com"]	["Los Angeles, CA, US", "Chicago, IL, US"]	
			["2401:db00:f01f:0002:face:0000:000b:0000", "2401:db00:f034:0001:face:0000:0013:0000"]	["cdt1", "mba1"]	["fledge205.01.cdt1.facebook.com", "fledge010.01.mba1.facebook.com"]	["Paris, FR", "Mombasa, KE"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f00b:2001:face:0000:0027:0000","2401:db00:f00b:0007:face:0000:0007:0000"]	["ort2"]	["fledge019.02.ort2.facebook.com","fledge167.01.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f013:100b:face:0000:0005:0000","2401:db00:f013:4018:face:0000:0025:0000"]	["dfw5"]	["fledge124.01.dfw5.facebook.com","fledge567.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f004:1007:face:0000:0019:0000","2401:db00:f01f:1013:face:0000:0003:0000","2401:db00:f01f:1005:face:0000:0019:0000"]	["mad1","cdg2"]	["fledge599.01.mad1.facebook.com","fledge632.01.cdg2.facebook.com","fledge503.01.cdg2.facebook.com"]	["Madrid, ES","Paris, FR"]	
			["2401:db00:f000:3014:face:0000:0007:0000"]	["mia3"]	["fledge499.02.mia3.facebook.com"]	["Miami, Florida, US"]	
			["2401:db00:f00b:0010:face:0000:0001:0000","2401:db00:f00b:000d:face:0000:0027:0000","2401:db00:f00d:000e:face:0000:000b:0000"]	["ort2","lax3"]	["fledge226.01.ort2.facebook.com","fledge543.01.ort2.facebook.com","fledge735.01.lax3.facebook.com"]	["Chicago, IL, US","Los Angeles, CA, US"]	
			["2401:db00:f01c:3015:face:0000:0005:0000","2401:db00:f01b:0005:face:0000:0011:0000","2401:db00:f01c:3010:face:0000:0027:0000"]	["amt2","frt3"]	["2401:db00:f01c:3015:face:0:5:0","fledge046.01.amt2.facebook.com","fledge156.02.frt3.facebook.com"]	["unknown","Amsterdam, NL","Frankfurt, DE"]	
			["2401:db00:f01b:0006:face:0000:001d:0000","2401:db00:f01b:0002:face:0000:0015:0000","2401:db00:f01b:100e:face:0000:0005:0000"]	["amt2"]	["fledge227.01.amt2.facebook.com","fledge141.01.amt2.facebook.com","2401:db00:f01b:100e:face:0:5:0"]	["Amsterdam, NL","unknown"]	
			["2401:db00:f013:400e:face:0000:000d:0000"]	["dfw5"]	["fledge642.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f00b:2005:face:0000:0013:0000","2401:db00:f00d:2003:face:0000:0023:0000"]	["ort2","lax3"]	["fledge144.02.ort2.facebook.com","fledge126.02.lax3.facebook.com"]	["Chicago, IL, US","Los Angeles, CA, US"]	
			["2401:db00:f009:1002:face:0000:0001:0000","2401:db00:f009:1006:face:0000:001b:0000"]	["arn2"]	["fledge020.02.arn2.facebook.com","fledge066.02.arn2.facebook.com"]	["Stockholm, SE"]	
			["2401:db00:f013:400a:face:0000:000b:0000","2401:db00:f013:1002:face:0000:0015:0000"]	["dfw5"]	["fledge588.02.dfw5.facebook.com","fledge111.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f01a:200f:face:0000:001f:0000","2401:db00:f01a:2006:face:0000:0001:0000","2401:db00:f01a:100c:face:0000:0017:0000","2401:db00:f01b:1007:face:0000:001f:0000"]	["lht6","lhr3"]	["fledge074.01.lht6.facebook.com","fledge293.01.lht6.facebook.com","fledge135.01.lhr3.facebook.com","2401:db00:f01b:1007:face:0:1f:0"]	["London, UK","unknown"]	
			["2401:db00:f01b:0004:face:0000:0023:0000","2401:db00:f006:2006:face:0000:0003:0000"]	["amt2","mrs2"]	["fledge260.01.amt2.facebook.com","fledge023.02.mrs2.facebook.com"]	["Amsterdam, NL","Marseille, FR"]	
			["2401:db00:f006:2005:face:0000:0003:0000","2401:db00:f006:1005:face:0000:0013:0000","2401:db00:f01b:100b:face:0000:0011:0000","2401:db00:f01c:3018:face:0000:0027:0000","2401:db00:f01b:0008:face:0000:0001:0000"]	["mrs2","amt2"]	["fledge082.02.mrs2.facebook.com","fledge235.01.mrs2.facebook.com","2401:db00:f01b:100b:face:0:1:0","2401:db00:f01c:3018:face:0:27:0","fledge262.01.amt2.facebook.com"]	["Marseille, FR","unknown","Amsterdam, NL"]	
			["2401:db00:f013:400b:face:0000:0023:0000"]	["dfw5"]	["fledge632.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f033:0001:face:0000:0011:0000","2401:db00:f00d:2007:face:0000:001b:0000","2401:db00:f00d:0014:face:0000:0019:0000","2401:db00:f00b:200f:face:0000:0005:0000"]	["msp1","lax3","ort2"]	["fledge042.01.msp1.facebook.com","fledge054.02.lax3.facebook.com","fledge131.01.lax3.facebook.com","fledge481.02.ort2.facebook.com"]	["Minneapolis, MN, US","Los Angeles, CA, US","Chicago, IL, US"]	
			["2401:db00:f006:1002:face:0000:0011:0000","2401:db00:f01b:100f:face:0000:0015:0000","2401:db00:f01b:1011:face:0000:0025:0000"]	["mrs2"]	["fledge193.01.mrs2.facebook.com","2401:db00:f01b:100f:face:0:15:0","2401:db00:f01b:1011:face:0:25:0"]	["Marseille, FR","unknown"]	
			["2401:db00:f000:200c:face:0000:0019:0000","2401:db00:f000:2010:face:0000:0023:0000"]	["mia3"]	["fledge263.01.mia3.facebook.com","fledge155.01.mia3.facebook.com"]	["Miami, Florida, US"]	
			["2401:db00:f00c:4018:face:0000:000b:0000"]	["sin2"]	["fledge215.02.sin2.facebook.com"]	["Singapore"]	
			["2401:db00:f01a:2005:face:0000:000f:0000","2401:db00:f01b:0006:face:0000:0001:0000"]	["lht6","amt2"]	["fledge459.01.lht6.facebook.com","fledge140.01.amt2.facebook.com"]	["London, UK","Amsterdam, NL"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f02a:000f:face:0000:000d:0000","2401:db00:f01b:1008:face:0000:0021:0000"]	["bom1"]	["fledge376.01.bom1.facebook.com","2401:db00:f01b:1008:face:0:21:0"]	["Bombay, IN","unknown"]	
			["2401:db00:f01c:000c:face:0000:001d:0000","2401:db00:f030:1004:face:0000:0007:0000"]	["frx5","maa2"]	["fledge111.01.frx5.facebook.com","fledge132.02.maa2.facebook.com"]	["Frankfurt, DE","Chennai, India"]	
			["2401:db00:f004:1012:face:0000:0019:0000","2401:db00:f01f:0007:face:0000:0015:0000","2401:db00:f01f:000e:face:0000:0017:0000"]	["mad1","cdt1"]	["fledge709.01.mad1.facebook.com","fledge041.01.cdt1.facebook.com","fledge062.01.cdt1.facebook.com"]	["Madrid, ES","Paris, FR"]	
			["2401:db00:f021:1003:face:0000:0005:0000","2401:db00:f01c:0018:face:0000:0009:0000"]	["bru2","frx5"]	["fledge292.01.bru2.facebook.com","fledge427.01.frx5.facebook.com"]	["Bruxelles, BE","Frankfurt, DE"]	
			["2401:db00:f01b:100b:face:0000:000f:0000","2401:db00:f016:0012:face:0000:001b:0000","2401:db00:f01b:1008:face:0000:0019:0000","2401:db00:f01b:100c:face:0000:0009:0000"]	["otp1"]	["2401:db00:f01b:100b:face:0:f:0","fledge106.01.otp1.facebook.com","2401:db00:f01b:1008:face:0:19:0","2401:db00:f01b:100c:face:0:9:0"]	["Bucharest, RO","unknown"]	
			["2401:db00:f013:400b:face:0000:001b:0000","2401:db00:f000:300e:face:0000:001b:0000"]	["dfw5","mia3"]	["fledge638.02.dfw5.facebook.com","fledge650.02.mia3.facebook.com"]	["Dallas, Texas, US","Miami, Florida, US"]	
			["2401:db00:f00b:0005:face:0000:000d:0000"]	["ort2"]	["fledge434.01.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f023:0008:face:0000:0001:0000","2401:db00:f01a:2014:face:0000:000d:0000"]	["jnb1","lht6"]	["fledge136.01.jnb1.facebook.com","fledge153.01.lht6.facebook.com"]	["Johannesburg, ZA","London, UK"]	
			["2401:db00:f01b:000e:face:0000:001f:0000"]	["amt2"]	["fledge254.01.amt2.facebook.com"]	["Amsterdam, NL"]	
			["2401:db00:f008:1014:face:0000:0009:0000","2401:db00:f008:1004:face:0000:000f:0000"]	["mxp1"]	["fledge645.01.mxp1.facebook.com","fledge147.01.mxp1.facebook.com"]	["Milano, IT"]	
			["2401:db00:f023:0002:face:0000:0017:0000","2401:db00:f01b:0011:face:0000:0027:0000"]	["jnb1","amt2"]	["fledge102.01.jnb1.facebook.com","fledge364.01.amt2.facebook.com"]	["Johannesburg, ZA","Amsterdam, NL"]	
			["2401:db00:f011:0009:face:0000:0001:0000"]	["atl3"]	["fledge713.01.atl3.facebook.com"]	["Atlanta, Georgia, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f01f:1014:face:0000:001d:0000","2401:db00:f01f:0005:face:0000:0023:0000"]	["cdg2","cdt1"]	["fledge655.01.cdg2.facebook.com","fledge111.01.cdt1.facebook.com"]	["Paris, FR"]	
			["2401:db00:f01c:3012:face:0000:0025:0000","2401:db00:f01c:3012:face:0000:0003:0000","2401:db00:f000:2011:face:0000:001f:0000"]	["frt3","mia3"]	["fledge206.02.frt3.facebook.com","fledge362.02.frt3.facebook.com","fledge269.01.mia3.facebook.com"]	["Frankfurt, DE","Miami, Florida, US"]	
			["2401:db00:f00d:2004:face:0000:0005:0000","2401:db00:f00b:2002:face:0000:0011:0000"]	["lax3","ort2"]	["fledge006.02.lax3.facebook.com","fledge032.02.ort2.facebook.com"]	["Los Angeles, CA, US","Chicago, IL, US"]	
			["2401:db00:f01f:0010:face:0000:0023:0000","2401:db00:f01c:0018:face:0000:0005:0000"]	["cdt1","frx5"]	["fledge194.01.cdt1.facebook.com","fledge205.01.frx5.facebook.com"]	["Paris, FR","Frankfurt, DE"]	
			["2401:db00:f013:400c:face:0000:0021:0000"]	["dfw5"]	["fledge362.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01c:200b:face:0000:000b:0000","2401:db00:f02a:100b:face:0000:0007:0000"]	["frt3","bom1"]	["fledge549.01.frt3.facebook.com","fledge168.02.bom1.facebook.com"]	["Frankfurt, DE","Bombay, IN"]	
			["2401:db00:f01b:100c:face:0000:0015:0000"]		["2401:db00:f01b:100c:face:0:15:0"]	["unknown"]	
			["2401:db00:f01c:3004:face:0000:0009:0000","2401:db00:f01c:3017:face:0000:0021:0000"]	["frt3"]	["fledge297.02.frt3.facebook.com","2401:db00:f01c:3017:face:0:21:0"]	["Frankfurt, DE","unknown"]	
			["2401:db00:f01c:3013:face:0000:0023:0000","2401:db00:f01c:3005:face:0000:0025:0000"]	["frt3"]	["fledge484.02.frt3.facebook.com","fledge344.02.frt3.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f00b:000d:face:0000:000b:0000"]	["ort2"]	["fledge547.01.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f01a:2009:face:0000:001f:0000","2401:db00:f01a:1009:face:0000:001b:0000"]	["lht6","lhr3"]	["fledge286.01.lht6.facebook.com","fledge192.01.lhr3.facebook.com"]	["London, UK"]	
			["2401:db00:f01b:0005:face:0000:0009:0000","2401:db00:f01b:1008:face:0000:0023:0000"]	["amt2"]	["fledge307.01.amt2.facebook.com","2401:db00:f01b:1008:face:0:23:0"]	["Amsterdam, NL","unknown"]	
			["2401:db00:f006:1005:face:0000:0023:0000","2401:db00:f01b:0003:face:0000:001d:0000"]	["mrs2","amt2"]	["fledge232.01.mrs2.facebook.com","fledge111.01.amt2.facebook.com"]	["Marseille, FR","Amsterdam, NL"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f01a:1006:face:0000:0015:0000","2401:db00:f01a:100e:face:0000:0025:0000","2401:db00:f01b:1009:face:0000:00f:0000","2401:db00:f01b:1007:face:0000:000b:0000","2401:db00:f01b:100a:face:0000:0013:0000","2401:db00:f01b:0002:face:0000:000b:0000"]	["lhr3","amt2"]	["fledge059.01.lhr3.facebook.com","fledge246.01.lhr3.facebook.com","2401:db00:f01b:1009:face:0:f:0","2401:db00:f01b:1007:face:0:b:0","2401:db00:f01b:100a:face:0:13:0","fledge145.01.amt2.facebook.com"]	["London, UK","unknown","Amsterdam, NL"]	
			["2401:db00:f00b:000d:face:0000:0013:0000","2401:db00:f00b:000c:face:0000:0013:0000"]	["ort2"]	["fledge551.01.ort2.facebook.com","fledge489.01.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f02a:0007:face:0000:000b:0000","2401:db00:f02a:1004:face:0000:000b:0000"]	["bom1"]	["fledge097.01.bom1.facebook.com","fledge073.02.bom1.facebook.com"]	["Bombay, IN"]	
			["2401:db00:f009:1003:face:0000:0001:0000","2401:db00:f009:1006:face:0000:0019:0000"]	["arn2"]	["fledge081.02.arn2.facebook.com","fledge062.02.arn2.facebook.com"]	["Stockholm, SE"]	
			["2401:db00:f033:0001:face:0000:001d:0000","2401:db00:f013:1014:face:0000:0019:0000","2401:db00:f013:1008:face:0000:005:0000"]	["msp1","dfw5"]	["fledge059.01.msp1.facebook.com","fledge234.01.dfw5.facebook.com","fledge387.01.dfw5.facebook.com"]	["Minneapolis, MN, US","Dallas, Texas, US"]	
			["2401:db00:f00c:0016:face:0000:0013:0000","2401:db00:f00c:000d:face:0000:000d:0000","2401:db00:f00c:000a:face:0000:0019:0000","2401:db00:f00d:0004:face:0000:0025:0000"]	["sin2","lax3"]	["fledge420.01.sin2.facebook.com","fledge275.01.sin2.facebook.com","fledge169.01.sin2.facebook.com","fledge936.01.lax3.facebook.com"]	["Singapore","Los Angeles, CA, US"]	
			["2401:db00:f01b:1010:face:0000:000b:0000","2401:db00:f01b:100a:face:0000:0001:0000","2401:db00:f01b:0009:face:0000:001f:0000","2401:db00:f01b:000d:face:0000:0019:0000"]	["amt2"]	["2401:db00:f01b:1010:face:0:b:0","2401:db00:f01b:100a:face:0:1:0","fledge160.01.amt2.facebook.com","fledge055.01.amt2.facebook.com"]	["unknown","Amsterdam, NL"]	
			["2401:db00:f013:1001:face:0000:001b:0000","2401:db00:f013:400d:face:0000:0011:0000"]	["dfw5"]	["fledge015.01.dfw5.facebook.com","fledge604.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f02a:1012:face:0000:0011:0000"]	["bom1"]	["fndedge367.02.bom1.facebook.com"]	["Bombay, IN"]	
			["2401:db00:f013:4002:face:0000:001d:0000", "2401:db00:f013:1010:face:0000:0015:0000"]	["dfw5"]	["fndedge408.02.dfw5.facebook.com", "fndedge328.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f013:400e:face:0000:001b:0000", "2401:db00:f013:1003:face:0000:0009:0000"]	["dfw5"]	["fndedge659.02.dfw5.facebook.com", "fndedge024.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f013:400f:face:0000:000d:0000"]	["dfw5"]	["fndedge670.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01a:200a:face:0000:0017:0000", "2401:db00:f01b:100e:face:0000:001b:0000"]	["lht6"]	["fndedge233.01.lht6.facebook.com", "2401:db00:f01b:100e:face:001b:0"]	["London, UK", "unknown"]	
			["2401:db00:f01b:0012:face:0000:000f:0000"]	["amt2"]	["fndedge320.01.amt2.facebook.com"]	["Amsterdam, NL"]	
			["2401:db00:f006:2007:face:0000:0005:0000", "2401:db00:f01f:1015:face:0000:0021:0000"]	["mrs2", "cdg2"]	["fndedge053.02.mrs2.facebook.com", "fndedge807.01.cdg2.facebook.com"]	["Marseille, FR", "Paris, FR"]	
			["2401:db00:f00b:0010:face:0000:0027:0000", "2401:db00:f00d:2001:face:0000:0019:0000"]	["ort2", "lax3"]	["fndedge117.01.ort2.facebook.com", "fndedge079.02.lax3.facebook.com"]	["Chicago, IL, US", "Los Angeles, CA, US"]	
			["2401:db00:f00b:200e:face:0000:0011:0000", "2401:db00:f00d:0009:face:0000:0027:0000"]	["ort2", "lax3"]	["fndedge100.02.ort2.facebook.com", "fndedge1025.01.lax3.facebook.com"]	["Chicago, IL, US", "Los Angeles, CA, US"]	
			["2401:db00:f00b:2005:face:0000:001b:0000", "2401:db00:f00d:0010:face:0000:0011:0000", "2401:db00:f00d:000e:face:0000:0023:0000", "2401:db00:f00d:2001:face:0000:0009:0000"]	["ort2", "lax3"]	["fndedge165.02.ort2.facebook.com", "fndedge751.01.lax3.facebook.com", "fndedge734.01.lax3.facebook.com", "fndedge056.02.lax3.facebook.com"]	["Chicago, IL, US", "Los Angeles, CA, US"]	
			["2401:db00:f01a:1004:face:0000:0003:0000", "2401:db00:f01a:1001:face:0000:0017:0000"]	["lhr3"]	["fndedge068.01.lhr3.facebook.com", "fndedge041.01.lhr3.facebook.com"]	["London, UK"]	
			["2401:db00:f034:0006:face:0000:000b:0000"]	["mba1"]	["fndedge114.01.mba1.facebook.com"]	["Mombasa, KE"]	
			["2401:db00:f01b:1010:face:0000:001b:0000"]		["2401:db00:f01b:1010:face:001b:0"]	["unknown"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f000:300f:face:0000:000f:0000","2401:db00:f000:2014:face:0000:001d:0000"]	["mia3"]	["fledge667.02.mia3.facebook.com","fledge511.01.mia3.facebook.com"]	["Miami, Florida, US"]	
			["2401:db00:f013:1011:face:0000:0003:0000","2401:db00:f013:100b:face:0000:000f:0000"]	["dfw5"]	["fledge304.01.dfw5.facebook.com","fledge130.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01b:100e:face:0000:0027:0000"]		["2401:db00:f01b:100e:face:0:27:0"]	["unknown"]	
			["2401:db00:f01c:0011:face:0000:0019:0000"]	["frx5"]	["fledge034.01.frx5.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f01f:000f:face:0000:0007:0000","2401:db00:f01c:000b:face:0000:0021:0000"]	["cdt1","frx5"]	["fledge103.01.cdt1.facebook.com","fledge411.01.frx5.facebook.com"]	["Paris, FR","Frankfurt, DE"]	
			["2401:db00:f036:0001:face:0000:000f:0000","2401:db00:f036:0001:face:0000:0017:0000"]	["dus1"]	["fledge004.01.dus1.facebook.com","fledge016.01.dus1.facebook.com"]	["Dusseldorf, DE"]	
			["2401:db00:f01b:000c:face:0000:0015:0000","2401:db00:f01b:000f:face:0000:000d:0000"]	["amt2"]	["fledge029.01.amt2.facebook.com","fledge210.01.amt2.facebook.com"]	["Amsterdam, NL"]	
			["2401:db00:f01c:0008:face:0000:0007:0000","2401:db00:f01b:100e:face:0000:000b:0000"]	["frx5"]	["fledge620.01.frx5.facebook.com","2401:db00:f01b:100e:face:0:b:0"]	["Frankfurt, DE","unknown"]	
			["2401:db00:f013:4018:face:0000:0019:0000","2401:db00:f013:1011:face:0000:000b:0000"]	["dfw5"]	["fledge573.02.dfw5.facebook.com","fledge307.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f013:400e:face:0000:0009:0000"]	["dfw5"]	["fledge651.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f006:1003:face:0000:0003:0000","2401:db00:f01b:0007:face:0000:0007:0000"]	["mrs2","amt2"]	["fledge202.01.mrs2.facebook.com","fledge305.01.amt2.facebook.com"]	["Marseille, FR","Amsterdam, NL"]	
			["2401:db00:f01a:200c:face:0000:0019:0000","2401:db00:f01a:2003:face:0000:001d:0000"]	["lht6"]	["fledge113.01.lht6.facebook.com","fledge221.01.lht6.facebook.com"]	["London, UK"]	
			["2401:db00:f013:4015:face:0000:0001:0000"]	["dfw5"]	["fledge501.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f030:1004:face:0000:0005:0000","2401:db00:f030:1002:face:0000:0025:0000","2401:db00:f01c:0002:face:0000:0021:0000","2401:db00:f01c:0017:face:0000:0001:0000"]	["maa2","frx5"]	["fledge126.02.maa2.facebook.com","fledge026.02.maa2.facebook.com","fledge060.01.frx5.facebook.com","fledge075.01.frx5.facebook.com"]	["Chennai, India","Frankfurt, DE"]	
			["2401:db00:f01f:1013:face:0000:0007:0000","2401:db00:f01a:200b:face:0000:001b:0000"]	["cdg2","lht6"]	["fledge637.01.cdg2.facebook.com","fledge454.01.lht6.facebook.com"]	["Paris, FR","London, UK"]	
			["2401:db00:f013:1011:face:0000:000d:0000"]	["dfw5"]	["fledge309.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f00b:2011:face:0000:0021:0000","2401:db00:f00b:0001:face:0000:001b:0000","2401:db00:f013:4001:face:0000:001f:0000"]	["ort2","dfw5"]	["fledge042.02.ort2.facebook.com","fledge354.01.ort2.facebook.com","fledge739.02.dfw5.facebook.com"]	["Chicago, IL, US","Dallas, Texas, US"]	
			["2401:db00:f00b:0006:face:0000:0019:0000","2401:db00:f033:0004:face:0000:0011:0000"]	["ort2","msp1"]	["fledge449.01.ort2.facebook.com","fledge094.01.msp1.facebook.com"]	["Chicago, IL, US","Minneapolis, MN, US"]	
			["2401:db00:f01b:100b:face:0000:0017:0000","2401:db00:f02a:1011:face:0000:0007:0000"]	["bom1"]	["2401:db00:f01b:100b:face:0:17:0","fledge278.02.bom1.facebook.com"]	["unknown","Bombay, IN"]	
			["2401:db00:f013:1003:face:0000:0011:0000","2401:db00:f02e:000b:face:0000:001d:0000"]	["dfw5","qro1"]	["fledge031.01.dfw5.facebook.com","fledge181.01.qro1.facebook.com"]	["Dallas, Texas, US","Queretaro, MX"]	
			["2401:db00:f013:400f:face:0000:0009:0000","2401:db00:f013:100c:face:0000:0007:0000"]	["dfw5"]	["fledge665.02.dfw5.facebook.com","fledge146.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f033:0005:face:0000:0017:0000","2401:db00:f033:0006:face:0000:0019:0000"]	["msp1"]	["fledge103.01.msp1.facebook.com","fledge014.01.msp1.facebook.com"]	["Minneapolis, MN, US"]	
			["2401:db00:f00b:000f:face:0000:001b:0000","2401:db00:f00d:2003:face:0000:0001:0000"]	["ort2","lax3"]	["fledge565.01.ort2.facebook.com","fledge104.02.lax3.facebook.com"]	["Chicago, IL, US","Los Angeles, CA, US"]	
			["2401:db00:f023:0006:face:0000:000d:0000","2401:db00:f034:0006:face:0000:001f:0000"]	["jnb1","mba1"]	["fledge018.01.jnb1.facebook.com","fledge104.01.mba1.facebook.com"]	["Johannesburg, ZA","Mombasa, KE"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f000:3008:face:0000:001d:0000", "2401:db00:f000:2009:face:0000:0027:0000"]	["mia3"]	["fledge089.02.mia3.facebook.com", "fledge188.01.mia3.facebook.com"]	["Miami, Florida, US"]	
			["2401:db00:f02a:000f:face:0000:0013:0000", "2401:db00:f02a:0003:face:0000:0011:0000"]	["bom1"]	["fledge375.01.bom1.facebook.com", "fledge302.01.bom1.facebook.com"]	["Bombay, IN"]	
			["2401:db00:f01c:2007:face:0000:000b:0000", "2401:db00:f01c:200d:face:0000:001d:0000", "2401:db00:f01c:3015:face:0000:0021:0000"]	["frt3"]	["fledge515.01.frt3.facebook.com", "fledge614.01.frt3.facebook.com", "2401:db00:f01c:3015:face:0:21:0"]	["Frankfurt, DE", "unknown"]	
			["2401:db00:f013:4016:face:0000:0001:0000"]	["dfw5"]	["fledge522.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01c:3002:face:0000:0003:0000", "2401:db00:f01c:2010:face:0000:0011:0000"]	["frt3"]	["fledge050.02.frt3.facebook.com", "fledge655.01.frt3.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f00c:0018:face:0000:000d:0000", "2401:db00:f022:1010:face:0000:0025:0000"]	["sin2", "sjc3"]	["fledge455.01.sin2.facebook.com", "fledge694.01.sjc3.facebook.com"]	["Singapore", "San Jose, CA, uS"]	
			["2401:db00:f006:100f:face:0000:0013:0000", "2401:db00:f01b:000d:face:0000:0013:0000"]	["mrs2", "amt2"]	["fledge262.01.mrs2.facebook.com", "fledge367.01.amt2.facebook.com"]	["Marseille, FR", "Amsterdam, NL"]	
			["2401:db00:f00d:0009:face:0000:0021:0000", "2401:db00:f00d:2005:face:0000:0019:0000", "2401:db00:f00d:000b:face:0000:001:0000", "2401:db00:f033:0002:face:0000:0009:0000"]	["lax3", "msp1"]	["fledge1012.01.lax3.facebook.com", "fledge148.02.lax3.facebook.com", "fledge887.01.lax3.facebook.com", "fledge028.01.msp1.facebook.com"]	["Los Angeles, CA, US", "Minneapolis, MN, US"]	
			["2401:db00:f01a:2013:face:0000:0011:0000", "2401:db00:f01a:2013:face:0000:0023:0000"]	["lht6"]	["fledge361.01.lht6.facebook.com", "fledge399.01.lht6.facebook.com"]	["London, UK"]	
			["2401:db00:f01b:1007:face:0000:0011:0000"]		["2401:db00:f01b:1007:face:0:11:0"]	["unknown"]	
			["2401:db00:f022:1006:face:0000:001b:0000"]	["sjc3"]	["fledge920.01.sjc3.facebook.com"]	["San Jose, CA, uS"]	
			["2401:db00:f013:4002:face:0000:0025:0000", "2401:db00:f013:4010:face:0000:000f:0000"]	["dfw5"]	["fledge407.02.dfw5.facebook.com", "fledge702.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f02a:000c:face:0000:0023:0000", "2401:db00:f02f:0002:face:0000:0001:0000", "2401:db00:f036:0005:face:0000:001f:0000"]	["bom1", "ber1", "dus1"]	["fledge213.01.bom1.facebook.com", "fledge015.01.ber1.facebook.com", "fledge118.01.dus1.facebook.com"]	["Bombay, IN", "Berlin, DE", "Dusseldorf, DE"]	
			["2401:db00:f013:400f:face:0000:0019:0000"]	["dfw5"]	["fledge671.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f013:4008:face:0000:001f:0000", "2401:db00:f013:4017:face:0000:0001:0000"]	["dfw5"]	["fledge428.02.dfw5.facebook.com", "fledge541.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f006:1012:face:0000:0011:0000", "2401:db00:f006:2009:face:0000:0027:0000"]	["mrs2"]	["fledge380.01.mrs2.facebook.com", "fledge068.02.mrs2.facebook.com"]	["Marseille, FR"]	
			["2401:db00:f00b:2011:face:0000:001b:0000", "2401:db00:f00b:0008:face:0000:0017:0000", "2401:db00:f00d:2006:face:0000:001d:0000", "2401:db00:f00d:2008:face:0000:0025:0000"]	["ort2", "lax3"]	["fledge238.02.ort2.facebook.com", "fledge285.01.ort2.facebook.com", "fledge082.02.lax3.facebook.com", "fledge091.02.lax3.facebook.com"]	["Chicago, IL, US", "Los Angeles, CA, US"]	
			["2401:db00:f033:0005:face:0000:0013:0000", "2401:db00:f013:4006:face:0000:0011:0000", "2401:db00:f02e:0008:face:0000:000b:0000", "2401:db00:f02e:0004:face:0000:0023:0000"]	["msp1", "dfw5", "qro1"]	["fledge120.01.msp1.facebook.com", "fledge033.02.dfw5.facebook.com", "fledge225.01.qro1.facebook.com", "fledge155.01.qro1.facebook.com"]	["Minneapolis, MN, US", "Dallas, Texas, US", "Queretaro, MX"]	
			["2401:db00:f009:1001:face:0000:0021:0000", "2401:db00:f009:0010:face:0000:0013:0000"]	["arn2"]	["fledge010.02.arn2.facebook.com", "fledge287.01.arn2.facebook.com"]	["Stockholm, SE"]	
			["2401:db00:f00c:4003:face:0000:0009:0000", "2401:db00:f00c:000f:face:0000:0003:0000"]	["sin2"]	["fledge077.02.sin2.facebook.com", "fledge313.01.sin2.facebook.com"]	["Singapore"]	
			["2401:db00:f013:4017:face:0000:0021:0000", "2401:db00:f013:4016:face:0000:000f:0000"]	["dfw5"]	["fledge560.02.dfw5.facebook.com", "fledge525.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01b:1008:face:0000:0007:0000"]		["2401:db00:f01b:1008:face:0:7:0"]	["unknown"]	
			["2401:db00:f01b:100e:face:0000:0025:0000", "2401:db00:f01b:000a:face:0000:000b:0000"]	["amt2"]	["2401:db00:f01b:100e:face:0:25:0", "fledge352.01.amt2.facebook.com"]	["unknown", "Amsterdam, NL"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f01f:0007:face:0000:0009:0000","2401:db00:f01f:0005:face:0000:001b:0000","2401:db00:f023:000b:face:0000:0009:0000"]	["cdt1","jnb1"]	["fnedge125.01.cdt1.facebook.com","fnedge164.01.cdt1.facebook.com","fnedge187.01.jnb1.facebook.com"]	["Paris, FR","Johannesburg, ZA"]	
			["2401:db00:f01b:000f:face:0000:001b:0000","2401:db00:f01b:1008:face:0000:0021:0000"]	["amt2"]	["fnedge334.01.amt2.facebook.com","2401:db00:f01b:1008:face:0:21:0"]	["Amsterdam, NL","unknown"]	
			["2401:db00:f013:1015:face:0000:000d:0000"]	["dfw5"]	["fnedge264.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f013:1009:face:0000:0027:0000","2401:db00:f013:400c:face:0000:0001:0000","2401:db00:f033:0006:face:0000:0003:0000"]	["dfw5","msp1"]	["fnedge440.01.dfw5.facebook.com","fnedge321.02.dfw5.facebook.com","fnedge010.01.msp1.facebook.com"]	["Dallas, Texas, US","Minneapolis, MN, US"]	
			["2401:db00:f013:100e:face:0000:0027:0000","2401:db00:f012:200d:face:0000:0003:0000"]	["dfw5","lga3"]	["fnedge197.01.dfw5.facebook.com","fnedge115.01.lga3.facebook.com"]	["Dallas, Texas, US","New York, NY, US"]	
			["2401:db00:f00b:2011:face:0000:0003:0000","2401:db00:f00b:2007:face:0000:001d:0000"]	["ort2"]	["fnedge205.02.ort2.facebook.com","fnedge512.02.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f01f:1003:face:0000:0005:0000"]	["cdg2"]	["fnedge450.01.cdg2.facebook.com"]	["Paris, FR"]	
			["2401:db00:f013:100c:face:0000:000d:0000"]	["dfw5"]	["fnedge148.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f02f:0007:face:0000:0003:0000","2401:db00:f02a:000b:face:0000:0019:0000","2401:db00:f02a:100b:face:0000:0015:0000"]	["ber1","bom1"]	["fnedge122.01.ber1.facebook.com","fnedge217.01.bom1.facebook.com","fnedge172.02.bom1.facebook.com"]	["Berlin, DE","Bombay, IN"]	
			["2401:db00:f016:0012:face:0000:001f:0000"]	["otp1"]	["fnedge310.01.otp1.facebook.com"]	["Bucharest, RO"]	
			["2401:db00:f01b:1010:face:0000:001b:0000","2401:db00:f006:1009:face:0000:0021:0000"]	["mrs2"]	["2401:db00:f01b:1010:face:0:1b:0","fnedge111.01.mrs2.facebook.com"]	["unknown","Marseille, FR"]	
			["2401:db00:f009:1004:face:0000:0001:0000"]	["arn2"]	["fnedge041.02.arn2.facebook.com"]	["Stockholm, SE"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f01b:0005:face:0000:0005:0000", "2401:db00:f01b:0004:face:0000:0013:0000", "2401:db00:f006:1005:face:0000:0007:0000"]	["amt2", "mrs2"]	["fledge038.01.amt2.facebook.com", "fledge342.01.amt2.facebook.com", "fledge229.01.mrs2.facebook.com"]	["Amsterdam, NL", "Marseille, FR"]	
			["2401:db00:f036:0004:face:0000:0027:0000", "2401:db00:f01c:2006:face:0000:0005:0000", "2401:db00:f01c:3008:face:0000:0025:0000"]	["dus1", "frt3"]	["fledge078.01.dus1.facebook.com", "fledge447.01.frt3.facebook.com", "fledge300.02.frt3.facebook.com"]	["Dusseldorf, DE", "Frankfurt, DE"]	
			["2401:db00:f006:2009:face:0000:0007:0000"]	["mrs2"]	["fledge070.02.mrs2.facebook.com"]	["Marseille, FR"]	
			["2401:db00:f013:1001:face:0000:001d:0000", "2401:db00:f013:4009:face:0000:0009:0000"]	["dfw5"]	["fledge016.01.dfw5.facebook.com", "fledge755.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f013:1015:face:0000:0011:0000"]	["dfw5"]	["fledge274.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01b:1011:face:0000:000b:0000", "2401:db00:f01b:1010:face:0000:0011:0000"]		["2401:db00:f01b:1011:face:0:b0", "2401:db00:f01b:1010:face:0:11:0"]	["unknown"]	
			["2401:db00:f033:0005:face:0000:0011:0000"]	["msp1"]	["fledge119.01.msp1.facebook.com"]	["Minneapolis, MN, US"]	
			["2401:db00:f01a:2011:face:0000:000d:0000"]	["lht6"]	["fledge047.01.lht6.facebook.com"]	["London, UK"]	
			["2401:db00:f00c:0005:face:0000:000b:0000", "2401:db00:f01b:100f:face:0000:001d:0000"]	["sin2"]	["fledge100.01.sin2.facebook.com", "2401:db00:f01b:100f:face:0:1d:0"]	["Singapore", "unknown"]	
			["2401:db00:f000:2010:face:0000:0019:0000", "2401:db00:f000:3007:face:0000:0013:0000"]	["mia3"]	["fledge174.01.mia3.facebook.com", "fledge619.02.mia3.facebook.com"]	["Miami, Florida, US"]	
			["2401:db00:f01c:0016:face:0000:0007:0000", "2401:db00:f007:1018:face:0000:000f:0000", "2401:db00:f007:1002:face:0000:0005:0000"]	["frx5", "vie1"]	["fledge536.01.frx5.facebook.com", "fledge119.01.vie1.facebook.com", "fledge510.01.vie1.facebook.com"]	["Frankfurt, DE", "Vienna, AT"]	
			["2401:db00:f013:100e:face:0000:001f:0000", "2401:db00:f013:4001:face:0000:000b:0000"]	["dfw5"]	["fledge195.01.dfw5.facebook.com", "fledge736.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f00b:200a:face:0000:0009:0000"]	["ort2"]	["fledge102.02.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f004:100d:face:0000:001f:0000","2401:db00:f01b:100b:face:0000:0027:0000"]	["mad1"]	["fledge899.01.mad1.facebook.com","2401:db00:f01b:100b:face:0:27:0"]	["Madrid, ES","unknown"]	
			["2401:db00:f01c:3005:face:0000:0003:0000","2401:db00:f01c:2005:face:0000:0015:0000","2401:db00:f01c:2010:face:0000:001b:0000","2401:db00:f004:1003:face:0000:0023:0000"]	["frt3","mad1"]	["fledge064.02.frt3.facebook.com","fledge429.01.frt3.facebook.com","fledge659.01.frt3.facebook.com","fledge525.01.mad1.facebook.com"]	["Frankfurt, DE","Madrid, ES"]	
			["2401:db00:f006:2005:face:0000:0003:0000"]	["mrs2"]	["fledge082.02.mrs2.facebook.com"]	["Marseille, FR"]	
			["2401:db00:f013:4004:face:0000:0001:0000"]	["dfw5"]	["fledge861.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f013:4006:face:0000:0001:0000","2401:db00:f013:400a:face:0000:001b:0000"]	["dfw5"]	["fledge021.02.dfw5.facebook.com","fledge594.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01c:200a:face:0000:0005:0000","2401:db00:f01c:200e:face:0000:0013:0000","2401:db00:f02f:0003:face:0000:0007:0000"]	["frt3","ber1"]	["fledge526.01.frt3.facebook.com","fledge624.01.frt3.facebook.com","fledge063.01.ber1.facebook.com"]	["Frankfurt, DE","Berlin, DE"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f00c:4006:face:0000:0003:0000","2401:db00:f00c:4001:face:0000:0021:0000","2401:db00:f00c:000b:face:0000:0017:0000","2401:db00:f00c:400d:face:0000:001f:0000","2401:db00:f00c:0008:face:0000:0013:0000","2401:db00:f00c:4003:face:0000:0009:0000","2401:db00:f00d:0012:face:0000:0003:0000","2401:db00:f00d:2006:face:0000:0021:0000","2401:db00:f00d:2006:face:0000:0027:0000","2401:db00:f00d:0011:face:0000:000b:0000","2401:db00:f00c:4015:face:0000:0027:0000","2401:db00:f00c:4004:face:0000:000f:0000","2401:db00:f00c:0014:face:0000:0027:0000","2401:db00:f00c:4007:face:0000:0005:0000","2401:db00:f022:1005:face:0000:00d:0000","2401:db00:f00d:0011:face:0000:0021:0000","2401:db00:f00d:000e:face:0000:0005:0000","2401:db00:f00d:0013:face:0000:0017:0000","2401:db00:f00c:4008:face:0000:0009:0000","2401:db00:f00c:0013:face:0000:0001d:0000"]	["sjc3","lax3","sin2"]	["fledge303.02.sin2.facebook.com","fledge033.02.sin2.facebook.com","fledge233.01.sin2.facebook.com","fledge018.02.sin2.facebook.com","fledge151.01.sin2.facebook.com","fledge077.02.sin2.facebook.com","fledge785.01.lax3.facebook.com","fledge074.02.lax3.facebook.com","fledge081.02.lax3.facebook.com","fledge789.01.lax3.facebook.com","fledge269.02.sin2.facebook.com","fledge382.02.sin2.facebook.com","fledge437.01.sin2.facebook.com","fledge365.02.sin2.facebook.com","fledge954.01.sjc3.facebook.com","fledge799.01.lax3.facebook.com","fledge739.01.lax3.facebook.com","fledge688.01.lax3.facebook.com","fledge171.02.sin2.facebook.com","fledge378.01.sin2.facebook.com","fledge889.01.sjc3.facebook.com","fledge021.02.lax3.facebook.com","fledge084.02.lax3.facebook.com","fledge098.02.lax3.facebook.com","fledge980.01.lax3.facebook.com","fledge078.01.lax3.facebook.com"]	["Singapore","San Jose, CA, uS","Los Angeles, CA, US"]	
			["2401:db00:f01b:1010:face:0000:001d:0000"]		["2401:db00:f01b:1010:face:0:1d:0"]	["unknown"]	
			["2401:db00:f01b:000b:face:0000:0015:0000"]	["amt2"]	["fledge099.01.amt2.facebook.com"]	["Amsterdam, NL"]	
			["2401:db00:f01c:0016:face:0000:001f:0000","2401:db00:f01c:0002:face:0000:0019:0000","2401:db00:f02a:1002:face:0000:0015:0000","2401:db00:f02a:100d:face:0000:001f:0000"]	["frx5","bom1"]	["fledge540.01.frx5.facebook.com","fledge236.01.frx5.facebook.com","fledge033.02.bom1.facebook.com","fledge185.02.bom1.facebook.com"]	["Frankfurt, DE","Bombay, IN"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f006:1011:face:0000:00011:0000", "2401:db00:f006:1014:face:0000:000d:0000", "2401:db00:f01c:000e:face:0000:0013:0000", "2401:db00:f01c:3001:face:0000:0003:0000"]	["mrs2", "frx5", "frt3"]	["fledge355.01.mrs2.facebook.com", "fledge400.01.mrs2.facebook.com", "fledge120.01.frx5.facebook.com", "fledge101.02.frt3.facebook.com"]	["Marseille, FR", "Frankfurt, DE"]	
			["2401:db00:f013:4004:face:0000:00009:0000", "2401:db00:f013:4015:face:0000:000d:0000"]	["dfw5"]	["fledge878.02.dfw5.facebook.com", "fledge503.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f013:100f:face:0000:0001d:0000"]	["dfw5"]	["fledge218.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f033:0001:face:0000:00009:0000"]	["msp1"]	["fledge056.01.msp1.facebook.com"]	["Minneapolis, MN, US"]	
			["2401:db00:f00b:200d:face:0000:00003:0000", "2401:db00:f00b:000c:face:0000:0025:0000", "2401:db00:f00d:2002:face:0000:0019:0000"]	["ort2", "lax3"]	["fledge123.02.ort2.facebook.com", "fledge486.01.ort2.facebook.com", "fledge138.02.lax3.facebook.com"]	["Chicago, IL, US", "Los Angeles, CA, US"]	
			["2401:db00:f01b:100e:face:0000:00009:0000", "2401:db00:f02a:1002:face:0000:0015:0000"]	["bom1"]	["2401:db00:f01b:100e:face:0000:00009:0000", "fledge033.02.bom1.facebook.com"]	["unknown", "Bombay, IN"]	
			["2401:db00:f013:4009:face:0000:0001d:0000", "2401:db00:f013:1009:face:0000:0001:0000"]	["dfw5"]	["fledge750.02.dfw5.facebook.com", "fledge421.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f00c:0002:face:0000:00005:0000"]	["sin2"]	["fledge032.01.sin2.facebook.com"]	["Singapore"]	
			["2401:db00:f00c:1014:face:0000:0001f:0000", "2401:db00:f00c:4005:face:0000:0011:0000"]	["sin6", "sin2"]	["fledge067.01.sin6.facebook.com", "fledge098.02.sin2.facebook.com"]	["Singapore"]	
			["2401:db00:f01a:200b:face:0000:00021:0000", "2401:db00:f01a:200f:face:0000:0023:0000"]	["lht6"]	["fledge059.01.lht6.facebook.com", "fledge024.01.lht6.facebook.com"]	["London, UK"]	
			["2401:db00:f013:4012:face:0000:00019:0000", "2401:db00:f013:4018:face:0000:0009:0000"]	["dfw5"]	["fledge394.02.dfw5.facebook.com", "fledge566.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f00b:200a:face:0000:0000d:0000", "2401:db00:f00d:2005:face:0000:0021:0000"]	["ort2", "lax3"]	["fledge310.02.ort2.facebook.com", "fledge154.02.lax3.facebook.com"]	["Chicago, IL, US", "Los Angeles, CA, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f01b:1009:face:0000:0017:0000", "2401:db00:f02a:1010:face:0000:001d:0000", "2401:db00:f02a:100c:face:0000:0007:0000", "2401:db00:f02a:0007:face:0000:0009:0000"]	["bom1"]	["2401:db00:f01b:1009:face:0:17:0", "fledge314.02.bom1.facebook.com", "fledge233.02.bom1.facebook.com", "fledge259.01.bom1.facebook.com"]	["unknown", "Bombay, IN"]	
			["2401:db00:f01a:2005:face:0000:0021:0000", "2401:db00:f01a:100c:face:0000:001b:0000"]	["lht6", "lhr3"]	["fledge326.01.lht6.facebook.com", "fledge162.01.lhr3.facebook.com"]	["London, UK"]	
			["2401:db00:f01c:200e:face:0000:000d:0000", "2401:db00:f01c:0009:face:0000:0005:0000", "2401:db00:f004:1010:face:0000:0009:0000", "2401:db00:f004:1017:face:0000:000b:0000"]	["frt3", "frx5", "mad1"]	["fledge637.01.frt3.facebook.com", "fledge644.01.frx5.facebook.com", "fledge950.01.mad1.facebook.com", "fledge790.01.mad1.facebook.com"]	["Frankfurt, DE", "Madrid, ES"]	
			["2401:db00:f02a:0007:face:0000:0023:0000", "2401:db00:f01c:0009:face:0000:0025:0000", "2401:db00:f01c:0003:face:0000:0023:0000"]	["bom1", "frx5"]	["fledge114.01.bom1.facebook.com", "fledge647.01.frx5.facebook.com", "fledge278.01.frx5.facebook.com"]	["Bombay, IN", "Frankfurt, DE"]	
			["2401:db00:f00b:200a:face:0000:0009:0000"]	["ort2"]	["fledge102.02.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f00d:2001:face:0000:0013:0000", "2401:db00:f00d:0004:face:0000:0009:0000", "2401:db00:f00b:000f:face:0000:0023:0000", "2401:db00:f00b:0003:face:0000:001f:0000"]	["lax3", "ort2"]	["fledge072.02.lax3.facebook.com", "fledge911.01.lax3.facebook.com", "fledge574.01.ort2.facebook.com", "fledge392.01.ort2.facebook.com"]	["Los Angeles, CA, US", "Chicago, IL, US"]	
			["2401:db00:f02a:0014:face:0000:0001:0000", "2401:db00:f01c:2012:face:0000:001d:0000"]	["bom1", "frt3"]	["fledge066.01.bom1.facebook.com", "fledge696.01.frt3.facebook.com"]	["Bombay, IN", "Frankfurt, DE"]	
			["2401:db00:f009:1002:face:0000:0021:0000", "2401:db00:f036:0004:face:0000:000f:0000"]	["arn2", "dus1"]	["fledge025.02.arn2.facebook.com", "fledge022.01.dus1.facebook.com"]	["Stockholm, SE", "Dusseldorf, DE"]	
			["2401:db00:f00b:2001:face:0000:0023:0000", "2401:db00:f033:0001:face:0000:0013:0000"]	["ort2", "msp1"]	["fledge006.02.ort2.facebook.com", "fledge050.01.msp1.facebook.com"]	["Chicago, IL, US", "Minneapolis, MN, US"]	
			["2401:db00:f01b:100f:face:0000:0027:0000"]		["2401:db00:f01b:100f:face:0:27:0"]	["unknown"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f01a:2013:face:0000:0009:0000"]	["lht6"]	["fledge423.01.lht6.facebook.com"]	["London, UK"]	
			["2401:db00:f013:1001:face:0000:001b:0000"]	["dfw5"]	["fledge015.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01f:000d:face:0000:0011:0000"]	["cdt1"]	["fledge243.01.cdt1.facebook.com"]	["Paris, FR"]	
			["2401:db00:f01b:0012:face:0000:0009:0000"]	["amt2"]	["fledge236.01.amt2.facebook.com"]	["Amsterdam, NL"]	
			["2401:db00:f013:400f:face:0000:0007:0000"]	["dfw5"]	["fledge664.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01b:1011:face:0000:0007:0000","2401:db00:f006:1011:face:0000:0003:0000"]	["mrs2"]	["2401:db00:f01b:1011:face:0:7:0","fledge343.01.mrs2.facebook.com"]	["unknown","Marseille, FR"]	
			["2401:db00:f013:100e:face:0000:0015:0000","2401:db00:f013:4006:face:0000:000b:0000"]	["dfw5"]	["fledge185.01.dfw5.facebook.com","fledge027.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01c:2010:face:0000:0001:0000"]	["frt3"]	["fledge643.01.frt3.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f006:100c:face:0000:001d:0000","2401:db00:f01b:1011:face:0000:0017:0000","2401:db00:f01b:000d:face:0000:0019:0000"]	["mrs2","amt2"]	["fledge164.01.mrs2.facebook.com","2401:db00:f01b:1011:face:0:17:0","fledge055.01.amt2.facebook.com"]	["Marseille, FR","unknown","Amsterdam, NL"]	
			["2401:db00:f00c:0003:face:0000:0011:0000","2401:db00:f00c:0017:face:0000:0017:0000","2401:db00:f00d:0007:face:0000:000f:0000","2401:db00:f00d:2002:face:0000:0025:0000"]	["sin2","lax3"]	["fledge047.01.sin2.facebook.com","fledge465.01.sin2.facebook.com","fledge981.01.lax3.facebook.com","fledge132.02.lax3.facebook.com"]	["Singapore","Los Angeles, CA, US"]	
			["2401:db00:f013:1012:face:0000:000f:0000"]	["dfw5"]	["fledge292.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01c:2001:face:0000:0017:0000"]	["frt3"]	["fledge361.01.frt3.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f02a:100f:face:0000:0013:0000","2401:db00:f01b:1007:face:0000:001d:0000"]	["bom1"]	["fledge286.02.bom1.facebook.com","2401:db00:f01b:1007:face:0:1d:0"]	["Bombay, IN","unknown"]	
			["2401:db00:f00d:2003:face:0000:0011:0000","2401:db00:f00b:2006:face:0000:001f:0000"]	["lax3","ort2"]	["fledge097.02.lax3.facebook.com","fledge206.02.ort2.facebook.com"]	["Los Angeles, CA, US","Chicago, IL, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f013:100e:face:0000:001f:0000"]	["dfw5"]	["fledge195.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f036:0005:face:0000:0021:0000","2401:db00:f006:1005:face:0000:0005:0000"]	["dus1","mrs2"]	["fledge119.01.dus1.facebook.com","fledge222.01.mrs2.facebook.com"]	["Dusseldorf, DE","Marseille, FR"]	
			["2401:db00:f01a:100f:face:0000:0015:0000"]	["lhr3"]	["fledge395.01.lhr3.facebook.com"]	["London, UK"]	
			["2401:db00:f013:1013:face:0000:0003:0000"]	["dfw5"]	["fledge462.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f00d:2008:face:0000:001d:0000"]	["lax3"]	["fledge078.02.lax3.facebook.com"]	["Los Angeles, CA, US"]	
			["2401:db00:f000:300d:face:0000:001b:0000","2401:db00:f000:2002:face:0000:0013:0000"]	["mia3"]	["fledge141.02.mia3.facebook.com","fledge170.01.mia3.facebook.com"]	["Miami, Florida, US"]	
			["2401:db00:f00d:2006:face:0000:0013:0000","2401:db00:f00d:0010:face:0000:0023:0000"]	["lax3"]	["fledge050.02.lax3.facebook.com","fledge756.01.lax3.facebook.com"]	["Los Angeles, CA, US"]	
			["2401:db00:f013:4018:face:0000:0023:0000","2401:db00:f013:4016:face:0000:0003:0000","2401:db00:f02e:000b:face:0000:0019:0000"]	["dfw5","qro1"]	["fledge569.02.dfw5.facebook.com","fledge524.02.dfw5.facebook.com","fledge211.01.qro1.facebook.com"]	["Dallas, Texas, US","Queretaro, MX"]	
			["2401:db00:f01f:1015:face:0000:0005:0000"]	["cdg2"]	["fledge801.01.cdg2.facebook.com"]	["Paris, FR"]	
			["2401:db00:f013:4011:face:0000:001f:0000"]	["dfw5"]	["fledge697.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f000:2014:face:0000:000f:0000"]	["mia3"]	["fledge509.01.mia3.facebook.com"]	["Miami, Florida, US"]	
			["2401:db00:f033:0003:face:0000:0019:0000"]	["msp1"]	["fledge080.01.msp1.facebook.com"]	["Minneapolis, MN, US"]	
			["2401:db00:f013:400f:face:0000:0021:0000","2401:db00:f013:1011:face:0000:000d:0000"]	["dfw5"]	["fledge680.02.dfw5.facebook.com","fledge309.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f013:400a:face:0000:0015:0000","2401:db00:f00b:2001:face:0000:001f:0000"]	["dfw5","ort2"]	["fledge587.02.dfw5.facebook.com","fledge003.02.ort2.facebook.com"]	["Dallas, Texas, US","Chicago, IL, US"]	
			["2401:db00:f01c:2009:face:0000:000f:0000","2401:db00:f01c:300d:face:0000:0027:0000"]	["frt3"]	["fledge498.01.frt3.facebook.com","fledge276.02.frt3.facebook.com"]	["Frankfurt, DE"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f013:1012:face:0000:0005:0000","2401:db00:f003:1016:face:0000:0009:0000"]	["dfw5","iad3"]	["fledge283.01.dfw5.facebook.com","fledge729.01.iad3.facebook.com"]	["Dallas, Texas, US","Washington, DC, US"]	
			["2401:db00:f01b:0001:face:0000:001d:0000","2401:db00:f01b:0004:face:0000:001f:0000","2401:db00:f016:0003:face:0000:0025:0000","2401:db00:f01b:100a:face:0000:000b:0000"]	["amt2","otp1"]	["fledge146.01.amt2.facebook.com","fledge167.01.amt2.facebook.com","twedge022.01.otp1.facebook.com","2401:db00:f01b:100a:face:0:b:0"]	["Amsterdam, NL","Bucharest, RO","unknown"]	
			["2401:db00:f013:400d:face:0000:001d:0000","2401:db00:f00b:2009:face:0000:000d:0000"]	["dfw5","ort2"]	["fledge611.02.dfw5.facebook.com","fledge551.02.ort2.facebook.com"]	["Dallas, Texas, US","Chicago, IL, US"]	
			["2401:db00:f01c:0012:face:0000:0017:0000","2401:db00:f01c:0006:face:0000:001b:0000"]	["frx5"]	["fledge172.01.frx5.facebook.com","fledge579.01.frx5.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f01b:0007:face:0000:0023:0000","2401:db00:f01b:000c:face:0000:0005:0000","2401:db00:f008:1018:face:0000:0013:0000"]	["amt2","mxp1"]	["fledge232.01.amt2.facebook.com","fledge193.01.amt2.facebook.com","fledge420.01.mxp1.facebook.com"]	["Amsterdam, NL","Milano, IT"]	
			["2401:db00:f013:1003:face:0000:0021:0000","2401:db00:f013:1002:face:0000:0027:0000"]	["dfw5"]	["fledge034.01.dfw5.facebook.com","fledge120.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01b:1012:face:0000:0005:0000","2401:db00:f030:1003:face:0000:001f:0000"]	["maa2"]	["2401:db00:f01b:1012:face:0:5:0","fledge055.02.maa2.facebook.com"]	["unknown","Chennai, India"]	
			["2401:db00:f030:0015:face:0000:0011:0000","2401:db00:f01b:1009:face:0000:0009:0000"]	["maa2"]	["fledge475.01.maa2.facebook.com","2401:db00:f01b:1009:face:0:9:0"]	["Chennai, India","unknown"]	
			["2401:db00:f012:2016:face:0000:001a:0000"]	["lga3"]	["fledge170.01.lga3.facebook.com"]	["New York, NY, US"]	
			["2401:db00:f012:200b:face:0000:0017:0000","2401:db00:f00d:0015:face:0000:0007:0000"]	["lga3","lax3"]	["fledge847.01.lga3.facebook.com","fledge161.01.lax3.facebook.com"]	["New York, NY, US","Los Angeles, CA, US"]	
			["2401:db00:f01c:0007:face:0000:0007:0000","2401:db00:f02a:0009:face:0000:0027:0000"]	["frx5","bom1"]	["fledge597.01.frx5.facebook.com","fledge086.01.bom1.facebook.com"]	["Frankfurt, DE","Bombay, IN"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f02f:0003:face:0000:0017:0000","2401:db00:f01c:000b:face:0000:0017:0000"]	["ber1","frx5"]	["fledge077.01.ber1.facebook.com","fledge436.01.frx5.facebook.com"]	["Berlin, DE","Frankfurt, DE"]	
			["2401:db00:f023:0001:face:0000:001d:0000","2401:db00:f01b:000c:face:0000:0007:0000"]	["jnb1","amt2"]	["fledge082.01.jnb1.facebook.com","fledge204.01.amt2.facebook.com"]	["Johannesburg, ZA","Amsterdam, NL"]	
			["2401:db00:f01a:2008:face:0000:000f:0000","2401:db00:f01a:200d:face:0000:000b:0000","2401:db00:f023:0009:face:0000:0027:0000"]	["lht6","jnb1"]	["fledge041.01.lht6.facebook.com","fledge413.01.lht6.facebook.com","fledge168.01.jnb1.facebook.com"]	["London, UK","Johannesburg, ZA"]	
			["2401:db00:f00b:000f:face:0000:0013:0000","2401:db00:f00b:000c:face:0000:000f:0000"]	["ort2"]	["fledge568.01.ort2.facebook.com","fledge477.01.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f013:4008:face:0000:0027:0000"]	["dfw5"]	["fledge440.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f00b:200f:face:0000:001d:0000","2401:db00:f00b:0002:face:0000:0001:0000"]	["ort2"]	["fledge488.02.ort2.facebook.com","fledge356.01.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f00b:2009:face:0000:0001:0000","2401:db00:f00d:0004:face:0000:0011:0000","2401:db00:f013:400c:face:0000:000b:0000","2401:db00:f013:1002:face:0000:0003:0000"]	["ort2","lax3","dfw5"]	["fledge538.02.ort2.facebook.com","fledge916.01.lax3.facebook.com","fledge331.02.dfw5.facebook.com","fledge102.01.dfw5.facebook.com"]	["Chicago, IL, US","Los Angeles, CA, US","Dallas, Texas, US"]	
			["2401:db00:f013:100e:face:0000:0023:0000","2401:db00:f013:4012:face:0000:0023:0000"]	["dfw5"]	["fledge200.01.dfw5.facebook.com","fledge400.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01c:000e:face:0000:0019:0000","2401:db00:f01c:0008:face:0000:0017:0000","2401:db00:f030:0005:face:0000:0015:face:0000:000b:0000"]	["frx5","maa2"]	["fledge047.01.frx5.facebook.com","fledge617.01.frx5.facebook.com","fledge100.01.maa2.facebook.com","fledge470.01.maa2.facebook.com"]	["Frankfurt, DE","Chennai, India"]	
			["2401:db00:f01c:0013:face:0000:0021:0000"]	["frx5"]	["fledge562.01.frx5.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f00d:0009:face:0000:0005:0000","2401:db00:f00b:2002:face:0000:0023:0000"]	["lax3","ort2"]	["fledge1008.01.lax3.facebook.com","fledge216.02.ort2.facebook.com"]	["Los Angeles, CA, US","Chicago, IL, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f01c:2002:face:0000:0017:0000"]	["frt3"]	["fndedge371.01.frt3.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f00d:2003:face:0000:0001:0000","2401:db00:f00d:0010:face:0000:0025:0000"]	["lax3"]	["fndedge104.02.lax3.facebook.com","fndedge784.01.lax3.facebook.com"]	["Los Angeles, CA, US"]	
			["2401:db00:f01c:2003:face:0000:0025:0000","2401:db00:f00c:000c:face:0000:0019:0000"]	["frt3","sin2"]	["fndedge398.01.frt3.facebook.com","fndedge201.01.sin2.facebook.com"]	["Frankfurt, DE","Singapore"]	
			["2401:db00:f011:0006:face:0000:0011:0000","2401:db00:f011:0006:face:0000:0019:0000"]	["atl3"]	["fndedge637.01.atl3.facebook.com","fndedge634.01.atl3.facebook.com"]	["Atlanta, Georgia, US"]	
			["2401:db00:f00d:2002:face:0000:0027:0000","2401:db00:f00d:0006:face:0000:0025:0000","2401:db00:f00d:0001:face:0000:0011:0000"]	["lax3"]	["fndedge035.02.lax3.facebook.com","fndedge956.01.lax3.facebook.com","fndedge498.01.lax3.facebook.com"]	["Los Angeles, CA, US"]	
			["2401:db00:f033:0001:face:0000:0013:0000","2401:db00:f00b:0002:face:0000:000f:0000"]	["msp1","ort2"]	["fndedge050.01.msp1.facebook.com","fndedge366.01.ort2.facebook.com"]	["Minneapolis, MN, US","Chicago, IL, US"]	
			["2401:db00:f01b:100a:face:0000:0021:0000"]		["2401:db00:f01b:100a:face:0:21:0"]	["unknown"]	
			["2401:db00:f012:200f:face:0000:0003:0000","2401:db00:f013:1018:face:0000:0003:0000"]	["lga3","dfw5"]	["fndedge079.01.lga3.facebook.com","fndedge444.01.dfw5.facebook.com"]	["New York, NY, US","Dallas, Texas, US"]	
			["2401:db00:f00d:2006:face:0000:0027:0000","2401:db00:f00d:000a:face:0000:001f:0000"]	["lax3"]	["fndedge081.02.lax3.facebook.com","fndedge873.01.lax3.facebook.com"]	["Los Angeles, CA, US"]	
			["2401:db00:f013:1016:face:0000:0027:0000","2401:db00:f013:4011:face:0000:0021:0000","2401:db00:f013:4008:face:0000:0017:0000","2401:db00:f033:0005:face:0000:0001:0000"]	["dfw5","msp1"]	["fndedge360.01.dfw5.facebook.com","fndedge700.02.dfw5.facebook.com","fndedge436.02.dfw5.facebook.com","fndedge101.01.msp1.facebook.com"]	["Dallas, Texas, US","Minneapolis, MN, US"]	
			["2401:db00:f013:100c:face:0000:0011:0000"]	["dfw5"]	["fndedge147.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f01c:0017:face:0000:0027:0000","2401:db00:f00c:0014:face:0000:0027:0000","2401:db00:f006:1014:face:0000:001d:0000"]	["frx5","sin2","mrs2"]	["fledge263.01.frx5.facebook.com","fledge437.01.sin2.facebook.com","fledge382.01.mrs2.facebook.com"]	["Frankfurt, DE","Singapore","Marseille, FR"]	
			["2401:db00:f01b:100e:face:0000:0011:0000","2401:db00:f006:2007:face:0000:000d:0000"]	["mrs2"]	["2401:db00:f01b:100e:face:0:11:0","fledge057.02.mrs2.facebook.com"]	["unknown","Marseille, FR"]	
			["2401:db00:f013:1014:face:0000:000b:0000","2401:db00:f013:1008:face:0000:0019:0000"]	["dfw5"]	["fledge226.01.dfw5.facebook.com","fledge385.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01c:0015:face:0000:0001:0000"]	["frx5"]	["fledge512.01.frx5.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f009:1002:face:0000:001b:0000","2401:db00:f009:1001:face:0000:0015:0000"]	["arn2"]	["fledge040.02.arn2.facebook.com","fledge022.02.arn2.facebook.com"]	["Stockholm, SE"]	
			["2401:db00:f013:4012:face:0000:0021:0000"]	["dfw5"]	["fledge397.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f013:400e:face:0000:001f:0000"]	["dfw5"]	["fledge658.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f006:1007:face:0000:0007:0000","2401:db00:f006:2008:face:0000:001f:0000","2401:db00:f01c:0007:face:0000:0021:0000"]	["mrs2","frx5"]	["fledge065.01.mrs2.facebook.com","fledge013.02.mrs2.facebook.com","fledge603.01.frx5.facebook.com"]	["Marseille, FR","Frankfurt, DE"]	
			["2401:db00:f008:1013:face:0000:000b:0000"]	["mxp1"]	["fledge606.01.mxp1.facebook.com"]	["Milano, IT"]	
			["2401:db00:f00d:2007:face:0000:0005:0000"]	["lax3"]	["fledge086.02.lax3.facebook.com"]	["Los Angeles, CA, US"]	
			["2401:db00:f000:300e:face:0000:0019:0000","2401:db00:f01b:000d:face:0000:001f:0000"]	["mia3","amt2"]	["fledge644.02.mia3.facebook.com","fledge309.01.amt2.facebook.com"]	["Miami, Florida, US","Amsterdam, NL"]	
			["2401:db00:f013:1002:face:0000:000b:0000","2401:db00:f013:4011:face:0000:000f:0000"]	["dfw5"]	["fledge110.01.dfw5.facebook.com","fledge690.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f00b:2011:face:0000:000b:0000","2401:db00:f00b:2006:face:0000:000f:0000"]	["ort2"]	["fledge111.02.ort2.facebook.com","fledge324.02.ort2.facebook.com"]	["Chicago, IL, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f013:1007:face:0000:0017:0000","2401:db00:f013:4015:face:0000:0027:0000"]	["dfw5"]	["fledge416.01.dfw5.facebook.com","fledge515.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f034:0003:face:0000:0003:0000"]	["mba1"]	["fledge043.01.mba1.facebook.com"]	["Mombasa, KE "]	
			["2401:db00:f012:200f:face:0000:0027:0000","2401:db00:f013:4011:face:0000:0015:0000"]	["lga3","dfw5"]	["fledge270.01.lga3.facebook.com","fledge696.02.dfw5.facebook.com"]	["New York, NY, US","Dallas, Texas, US"]	
			["2401:db00:f00d:2008:face:0000:000d:0000","2401:db00:f00d:0010:face:0000:0003:0000"]	["lax3"]	["fledge034.02.lax3.facebook.com","fledge753.01.lax3.facebook.com"]	["Los Angeles, CA, US"]	
			["2401:db00:f01f:1012:face:0000:0019:0000","2401:db00:f01f:000e:face:0000:0007:0000","2401:db00:f01b:0009:face:0000:000f:0000"]	["cdg2","cdt1","amt2"]	["fledge613.01.cdg2.facebook.com","fledge133.01.cdt1.facebook.com","fledge118.01.amt2.facebook.com"]	["Paris, FR","Amsterdam, NL"]	
			["2401:db00:f00b:0008:face:0000:0003:0000","2401:db00:f013:1012:face:0000:0025:0000"]	["ort2","dfw5"]	["fledge048.01.ort2.facebook.com","fledge298.01.dfw5.facebook.com"]	["Chicago, IL, US","Dallas, Texas, US"]	
			["2401:db00:f01b:100f:face:0000:0019:0000","2401:db00:f01b:1008:face:0000:0015:0000"]		["2401:db00:f01b:100f:face:0:19:0","2401:db00:f01b:1008:face:0:15:0"]	["unknown"]	
			["2401:db00:f01c:0018:face:0000:000d:0000"]	["frx5"]	["fledge053.01.frx5.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f030:000c:face:0000:000f:0000","2401:db00:f01c:000e:face:0000:0013:0000"]	["maa2","frx5"]	["fledge252.01.maa2.facebook.com","fledge120.01.frx5.facebook.com"]	["Chennai, India","Frankfurt, DE"]	
			["2401:db00:f01c:0009:face:0000:0007:0000"]	["frx5"]	["fledge648.01.frx5.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f00b:200e:face:0000:0013:0000","2401:db00:f013:1015:face:0000:0009:0000"]	["ort2","dfw5"]	["fledge181.02.ort2.facebook.com","fledge270.01.dfw5.facebook.com"]	["Chicago, IL, US","Dallas, Texas, US"]	
			["2401:db00:f013:1011:face:0000:000d:0000"]	["dfw5"]	["fledge309.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f013:400e:face:0000:001d:0000"]	["dfw5"]	["fledge655.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f013:1015:face:0000:0017:0000","2401:db00:f013:400a:face:0000:001d:0000","2401:db00:f013:400e:face:0000:000f:0000"]	["dfw5"]	["fledge277.01.dfw5.facebook.com","fledge595.02.dfw5.facebook.com","fledge657.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f016:0004:face:0000:0011:0000","2401:db00:f01b:000c:face:0000:001b:0000"]	["otp1","amt2"]	["fledge435.01.otp1.facebook.com","fledge036.01.amt2.facebook.com"]	["Bucharest, RO","Amsterdam, NL"]	
			["2401:db00:f013:4004:face:0000:0027:0000","2401:db00:f013:4007:face:0000:001b:0000"]	["dfw5"]	["fledge863.02.dfw5.facebook.com","fledge798.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f036:0006:face:0000:0015:0000","2401:db00:f036:0005:face:0000:0023:0000"]	["dus1"]	["fledge087.01.dus1.facebook.com","fledge110.01.dus1.facebook.com"]	["Dusseldorf, DE"]	
			["2401:db00:f02a:0003:face:0000:000f:0000","2401:db00:f02a:1008:face:0000:0003:0000","2401:db00:f01c:000d:face:0000:0015:0000","2401:db00:f01c:0011:face:0000:0003:0000"]	["bom1","frx5"]	["fledge137.01.bom1.facebook.com","fledge207.02.bom1.facebook.com","fledge501.01.frx5.facebook.com","fledge232.01.frx5.facebook.com"]	["Bombay, IN","Frankfurt, DE"]	
			["2401:db00:f004:1002:face:0000:0005:0000","2401:db00:f01c:2008:face:0000:0027:0000","2401:db00:f01c:300e:face:0000:001d:0000","2401:db00:f01c:0017:face:0000:0015:0000"]	["mad1","frt3","frx5"]	["fledge513.01.mad1.facebook.com","fledge473.01.frt3.facebook.com","fledge113.02.frt3.facebook.com","fledge366.01.frx5.facebook.com"]	["Madrid, ES","Frankfurt, DE"]	
			["2401:db00:f01c:0006:face:0000:000f:0000"]	["frx5"]	["fledge570.01.frx5.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f000:2007:face:0000:0011:0000","2401:db00:f00b:200a:face:0000:000f:0000"]	["mia3","ort2"]	["fledge111.01.mia3.facebook.com","fledge195.02.ort2.facebook.com"]	["Miami, Florida, US","Chicago, IL, US"]	
			["2401:db00:f01c:0017:face:0000:0013:0000"]	["frx5"]	["fledge105.01.frx5.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f013:1014:face:0000:0011:0000","2401:db00:f013:4012:face:0000:000d:0000","2401:db00:f013:1003:face:0000:001f:0000","2401:db00:f02e:0002:face:0000:0015:0000"]	["dfw5","qro1"]	["fledge231.01.dfw5.facebook.com","fledge392.02.dfw5.facebook.com","fledge036.01.dfw5.facebook.com","fledge050.01.qro1.facebook.com"]	["Dallas, Texas, US","Queretaro, MX"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f00d:2001:face:0000:001f:0000","2401:db00:f00b:000c:face:0000:0007:0000"]	["lax3","ort2"]	["fnedge113.02.lax3.facebook.com","fnedge481.01.ort2.facebook.com"]	["Los Angeles, CA, US","Chicago, IL, US"]	
			["2401:db00:f02a:1010:face:0000:001b:0000"]	["bom1"]	["fnedge311.02.bom1.facebook.com"]	["Bombay, IN"]	
			["2401:db00:f00b:0010:face:0000:0005:0000"]	["ort2"]	["fnedge228.01.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f00d:2007:face:0000:001b:0000","2401:db00:f00b:200f:face:0000:000d:0000"]	["lax3","ort2"]	["fnedge054.02.lax3.facebook.com","fnedge489.02.ort2.facebook.com"]	["Los Angeles, CA, US","Chicago, IL, US"]	
			["2401:db00:f013:100a:face:0000:001f:0000","2401:db00:f013:4005:face:0000:001b:0000"]	["dfw5"]	["fnedge256.01.dfw5.facebook.com","fnedge853.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f00b:200a:face:0000:001f:0000","2401:db00:f00b:0008:face:0000:0027:0000","2401:db00:f012:2015:face:0000:001d:0000","2401:db00:f013:100d:face:0000:0001:0000"]	["ort2","lga3","dfw5"]	["fnedge313.02.ort2.facebook.com","fnedge145.01.ort2.facebook.com","fnedge217.01.lga3.facebook.com","fnedge161.01.dfw5.facebook.com"]	["Chicago, IL, US","New York, NY, US","Dallas, Texas, US"]	
			["2401:db00:f009:1004:face:0000:0023:0000"]	["arn2"]	["fnedge051.02.arn2.facebook.com"]	["Stockholm, SE"]	
			["2401:db00:f01b:1012:face:0000:0005:0000","2401:db00:f01b:0008:face:0000:0017:0000"]	["amt2"]	["2401:db00:f01b:1012:face:0000:0005:0000","fnedge184.01.amt2.facebook.com"]	["unknown","Amsterdam, NL"]	
			["2401:db00:f01c:0005:face:0000:000d:0000"]	["frx5"]	["fnedge294.01.frx5.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f01b:1010:face:0000:000b:0000","2401:db00:f01b:000a:face:0000:0019:0000","2401:db00:f036:0002:face:0000:000d:0000","2401:db00:f036:0003:face:0000:0011:0000"]	["amt2","dus1"]	["2401:db00:f01b:1010:face:0000:000b:0000","fnedge107.01.amt2.facebook.com","fnedge053.01.dus1.facebook.com","fnedge062.01.dus1.facebook.com"]	["unknown","Amsterdam, NL","Dusseldorf, DE"]	
			["2401:db00:f013:4012:face:0000:0017:0000","2401:db00:f00b:0010:face:0000:0027:0000"]	["dfw5","ort2"]	["fnedge387.02.dfw5.facebook.com","fnedge117.01.ort2.facebook.com"]	["Dallas, Texas, US","Chicago, IL, US"]	
			["2401:db00:f00b:2002:face:0000:0025:0000","2401:db00:f00d:2004:face:0000:0017:0000"]	["ort2","lax3"]	["fnedge105.02.ort2.facebook.com","fnedge010.02.lax3.facebook.com"]	["Chicago, IL, US","Los Angeles, CA, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f01c:2008:face:0000:0007:0000","2401:db00:f01c:2012:face:0000:0011:0000"]	["frt3"]	["fndedge467.01.frt3.facebook.com","fndedge694.01.frt3.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f01b:1010:face:0000:0007:0000"]		["2401:db00:f01b:1010:face:0:7:0"]	["unknown"]	
			["2401:db00:f030:1005:face:0000:0019:0000","2401:db00:f030:0006:face:0000:001f:0000"]	["maa2"]	["fndedge141.02.maa2.facebook.com","fndedge119.01.maa2.facebook.com"]	["Chennai, India"]	
			["2401:db00:f00d:0012:face:0000:0011:0000","2401:db00:f00b:0005:face:0000:0025:0000"]	["lax3","ort2"]	["fndedge765.01.lax3.facebook.com","fndedge420.01.ort2.facebook.com"]	["Los Angeles, CA, US","Chicago, IL, US"]	
			["2401:db00:f009:1003:face:0000:001b:0000","2401:db00:f009:1001:face:0000:000b:0000"]	["arn2"]	["fndedge095.02.arn2.facebook.com","fndedge017.02.arn2.facebook.com"]	["Stockholm, SE"]	
			["2401:db00:f013:4015:face:0000:0009:0000","2401:db00:f013:1007:face:0000:0023:0000"]	["dfw5"]	["fndedge507.02.dfw5.facebook.com","fndedge404.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f009:1001:face:0000:001d:0000","2401:db00:f036:0001:face:0000:001f:0000"]	["arn2","dus1"]	["fndedge001.02.arn2.facebook.com","fndedge009.01.dus1.facebook.com"]	["Stockholm, SE","Dusseldorf, DE"]	
			["2401:db00:f013:100c:face:0000:0021:0000","2401:db00:f013:1016:face:0000:0027:0000"]	["dfw5"]	["fndedge158.01.dfw5.facebook.com","fndedge360.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01c:2003:face:0000:000d:0000"]	["frt3"]	["fndedge393.01.frt3.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f00b:0010:face:0000:0019:0000"]	["ort2"]	["fndedge264.01.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f012:2008:face:0000:0005:0000","2401:db00:f00d:2001:face:0000:0001:0000"]	["lga3","lax3"]	["fndedge736.01.lga3.facebook.com","fndedge145.02.lax3.facebook.com"]	["New York, NY, US","Los Angeles, CA, US"]	
			["2401:db00:f01b:1008:face:0000:0007:0000"]		["2401:db00:f01b:1008:face:0:7:0"]	["unknown"]	
			["2401:db00:f013:4004:face:0000:001f:0000","2401:db00:f013:4016:face:0000:0023:0000","2401:db00:f013:1017:face:0000:0009:0000","2401:db00:f013:1007:face:0000:000b:0000"]	["dfw5"]	["fndedge868.02.dfw5.facebook.com","fndedge534.02.dfw5.facebook.com","fndedge366.01.dfw5.facebook.com","fndedge402.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f013:1011:face:0000:0019:0000"]	["dfw5"]	["fndedge317.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f013:400e:face:0000:0003:0000", "2401:db00:f013:1002:face:0000:0009:0000", "2401:db00:f013:400b:face:0000:001b:0000"]	["dfw5"]	["fndedge643.02.dfw5.facebook.com", "fndedge107.01.dfw5.facebook.com", "fndedge638.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01c:3018:face:0000:0011:0000"]		["2401:db00:f01c:3018:face:0:11:0"]	["unknown"]	
			["2401:db00:f01a:2015:face:0000:001d:0000"]	["lht6"]	["fndedge079.01.lht6.facebook.com"]	["London, UK"]	
			["2401:db00:f006:1018:face:0000:000d:0000"]	["mrs2"]	["fndedge431.01.mrs2.facebook.com"]	["Marseille, FR"]	
			["2401:db00:f000:200f:face:0000:0025:0000", "2401:db00:f000:2016:face:0000:000b:0000"]	["mia3"]	["fndedge340.01.mia3.facebook.com", "fndedge565.01.mia3.facebook.com"]	["Miami, Florida, US"]	
			["2401:db00:f013:1005:face:0000:0005:0000", "2401:db00:f013:4018:face:0000:001d:0000"]	["dfw5"]	["fndedge085.01.dfw5.facebook.com", "fndedge577.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01c:000d:face:0000:0003:0000", "2401:db00:f006:1007:face:0000:0007:0000", "2401:db00:f006:2009:face:0000:0003:0000"]	["frx5", "mrs2"]	["fndedge493.01.frx5.facebook.com", "fndedge065.01.mrs2.facebook.com", "fndedge065.02.mrs2.facebook.com"]	["Frankfurt, DE", "Marseille, FR"]	
			["2401:db00:f01c:300b:face:0000:0015:0000", "2401:db00:f01a:1007:face:0000:001b:0000"]	["frt3", "lhr3"]	["fndedge255.02.frt3.facebook.com", "fndedge227.01.lhr3.facebook.com"]	["Frankfurt, DE", "London, UK"]	
			["2401:db00:f033:0004:face:0000:001d:0000"]	["msp1"]	["fndedge089.01.msp1.facebook.com"]	["Minneapolis, MN, US"]	
			["2401:db00:f01b:1011:face:0000:0019:0000"]		["2401:db00:f01b:1011:face:0:19:0"]	["unknown"]	
			["2401:db00:f006:2009:face:0000:0003:0000", "2401:db00:f01b:000c:face:0000:0027:0000"]	["mrs2", "amt2"]	["fndedge065.02.mrs2.facebook.com", "fndedge349.01.amt2.facebook.com"]	["Marseille, FR", "Amsterdam, NL"]	
			["2401:db00:f036:0004:face:0000:0011:0000", "2401:db00:f009:1001:face:0000:0005:0000"]	["dus1", "arn2"]	["fndedge027.01.dus1.facebook.com", "fndedge009.02.arn2.facebook.com"]	["Dusseldorf, DE", "Stockholm, SE"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f004:1006:face:0000:000d:0000", "2401:db00:f01b:100e:face:0000:0027:0000", "2401:db00:f01b:100f:face:0000:001f:0000"]	["mad1"]	["fledge620.01.mad1.facebook.com", "2401:db00:f01b:100e:face:0:27:0", "2401:db00:f01b:100f:face:0:1f:0"]	["Madrid, ES", "unknown"]	
			["2401:db00:f013:4010:face:0000:001b:0000", "2401:db00:f013:1013:face:0000:000d:0000"]	["dfw5"]	["fledge712.02.dfw5.facebook.com", "fledge468.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f013:4018:face:0000:0017:0000"]	["dfw5"]	["fledge570.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f00d:0004:face:0000:0023:0000", "2401:db00:f00d:2002:face:0000:0005:0000"]	["lax3"]	["fledge918.01.lax3.facebook.com", "fledge139.02.lax3.facebook.com"]	["Los Angeles, CA, US"]	
			["2401:db00:f01a:1006:face:0000:000d:0000", "2401:db00:f01a:100e:face:0000:0007:0000"]	["lhr3"]	["fledge270.01.lhr3.facebook.com", "fledge276.01.lhr3.facebook.com"]	["London, UK"]	
			["2401:db00:f013:4006:face:0000:0021:0000", "2401:db00:f013:100d:face:0000:0007:0000"]	["dfw5"]	["fledge067.02.dfw5.facebook.com", "fledge164.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f00d:0008:face:0000:0021:0000", "2401:db00:f00b:0008:face:0000:001b:0000"]	["lax3", "ort2"]	["fledge1005.01.lax3.facebook.com", "fledge258.01.ort2.facebook.com"]	["Los Angeles, CA, US", "Chicago, IL, US"]	
			["2401:db00:f00c:0010:face:0000:0011:0000", "2401:db00:f00c:400b:face:0000:001d:0000", "2401:db00:f00c:3017:face:0000:0001:0000"]	["sin2", "sin6"]	["fledge286.01.sin2.facebook.com", "fledge248.02.sin2.facebook.com", "fledge391.02.sin6.facebook.com"]	["Singapore"]	
			["2401:db00:f01b:1012:face:0000:0009:0000"]		["2401:db00:f01b:1012:face:0:9:0"]	["unknown"]	
			["2401:db00:f013:400c:face:0000:0023:0000"]	["dfw5"]	["fledge322.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f01a:100e:face:0000:001b:0000", "2401:db00:f023:0002:face:0000:0019:0000"]	["lhr3", "jnb1"]	["fledge177.01.lhr3.facebook.com", "fledge079.01.jnb1.facebook.com"]	["London, UK", "Johannesburg, ZA"]	
			["2401:db00:f013:100b:face:0000:0025:0000"]	["dfw5"]	["fledge140.01.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f009:1003:face:0000:0019:0000"]	["arn2"]	["fledge085.02.arn2.facebook.com"]	["Stockholm, SE"]	

victim_phone	attacker_ips	victim_ips	server_ips	centers	server	center_countries	attacker_phones
			["2401:db00:f00c:0008:face:0000:0019:0000","2401:db00:f00c:000b:face:0000:0003:0000","2401:db00:f00d:0001:face:0000:0005:0000","2401:db00:f00d:0015:face:0000:0005:0000"]	["sin2","lax3"]	["fledge141.01.sin2.facebook.com","fledge228.01.sin2.facebook.com","fledge490.01.lax3.facebook.com","fledge105.01.lax3.facebook.com"]	["Singapore","Los Angeles, CA, US"]	
			["2401:db00:f01c:0003:face:0000:0023:0000"]	["frx5"]	["fledge278.01.frx5.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f013:4011:face:0000:000f:0000"]	["dfw5"]	["fledge690.02.dfw5.facebook.com"]	["Dallas, Texas, US"]	
			["2401:db00:f006:2008:face:0000:0015:0000","2401:db00:f01b:0009:face:0000:0021:0000","2401:db00:f01b:1007:face:0000:0019:0000"]	["mrs2","amt2"]	["fledge008.02.mrs2.facebook.com","fledge259.01.amt2.facebook.com","2401:db00:f01b:1007:face:0:19:0"]	["Marseille, FR","Amsterdam, NL","unknown"]	
			["2401:db00:f00b:000c:face:0000:0023:0000"]	["ort2"]	["fledge485.01.ort2.facebook.com"]	["Chicago, IL, US"]	
			["2401:db00:f006:100f:face:0000:000d:0000","2401:db00:f036:0005:face:0000:001b:0000"]	["mrs2","dus1"]	["fledge264.01.mrs2.facebook.com","fledge116.01.dus1.facebook.com"]	["Marseille, FR","Dusseldorf, DE"]	
			["2401:db00:f00d:2007:face:0000:0025:0000"]	["lax3"]	["fledge120.02.lax3.facebook.com"]	["Los Angeles, CA, US"]	
			["2401:db00:f01c:3003:face:0000:000b:0000","2401:db00:f01c:3001:face:0000:0003:0000"]	["frt3"]	["fledge338.02.frt3.facebook.com","fledge101.02.frt3.facebook.com"]	["Frankfurt, DE"]	
			["2401:db00:f01a:1001:face:0000:0009:0000","2401:db00:f01a:1009:face:0000:0015:0000"]	["lhr3"]	["fledge226.01.lhr3.facebook.com","fledge012.01.lhr3.facebook.com"]	["London, UK"]	
			["2401:db00:f00d:2002:face:0000:0021:0000","2401:db00:f00b:2009:face:0000:001f:0000","2401:db00:f00b:2003:face:0000:000b:0000"]	["lax3","ort2"]	["fledge049.02.lax3.facebook.com","fledge552.02.ort2.facebook.com","fledge061.02.ort2.facebook.com"]	["Los Angeles, CA, US","Chicago, IL, US"]	
			["2401:db00:f01b:000d:face:0000:0003:0000","2401:db00:f01b:000b:face:0000:0023:0000"]	["amt2"]	["fledge092.01.amt2.facebook.com","fledge045.01.amt2.facebook.com"]	["Amsterdam, NL"]	

EXHIBIT 19

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment



Date: June 4, 2020

To: Melody Drummond Hansen
O'Melveny & Myers LLP
2764 Sand Hill Road
Menlo Park, CA
650-473-2636
Mdrummondhansen@omm.com

In reference to the delivered Subpoena for Civil Action No. 4:19-cv-07123-PJH to appear before the United States District Court for the Northern District of California at O'Melveny & Myers LLP located at 400 South Hope Street, 18th Floor, Los Angeles, CA 90071-2899 on June 17, 2020 at 900AM. In lieu of personal appearance, Quadrantet Enterprises, LLC provides you with the following records regarding the requested IP:

IP address:

[REDACTED]

For the period of October 1, 2017- October 29, 2019

The listed IP addresses belongs to a client which is a customer who provides VPN services to End users. Quadrantet does not have information pertaining to the end users of the IP addresses in question. The information regarding this client is attached and we advise to approach him if further information is needed.

Client ID: 6187

Name: [REDACTED]

Company: 365 Online Technology JSC

Address: [REDACTED]

E-mail: [REDACTED]

Phone: [REDACTED]

This has been Quadrantet's client since February 17, 2016

Clients billing information: Payment method is credit card and Paypal.

Paypal address: [REDACTED]

Credit Card information:

[REDACTED]



Quadranet Enterprises, LLC doesn't hold specific records of activity for each of those IP addresses and the activities recorded for this client is a list of invoices, and scheduled payments for it.

Please contact us at Subpoena@quadranet.com if further information is needed.

Sincerely,

QuadraNet Compliance

EXHIBIT 20

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment

Requested information

1. [REDACTED]: Does not belong to us
2. [REDACTED]:

There are 2 customers:

- <https://prnt.sc/tzb9j5>
- <https://prnt.sc/tzb9p4>
- Paypal email address: [REDACTED]
- Service from 07/05/2017 to 09/05/2018

And:

- <https://prnt.sc/tzbaqh>
 - <https://prnt.sc/tzbauf>
 - Service from 09/28/2018 until now
3. [REDACTED]
 - <https://prnt.sc/tzbc4p>
 - <https://prnt.sc/tzbc8h>
 - <https://bitpay.com/insight/#/BTC/mainnet/tx/56c13b9895e6f63be187e0dc14f6bc3aed6375d6e6711883abe0b36342e1af13>
 4. [REDACTED]: The same customer [REDACTED]
 5. [REDACTED]
 - <https://prnt.sc/tzbf6b>
 - <https://prnt.sc/tzbfak>
 - <https://bitpay.com/insight/#/BTC/mainnet/tx/e2e1bd448dabfb0ea2b00f40a87f740c42908f7a17a5e4f50f4bc71b9da16b19>
 6. [REDACTED]
 - <https://prnt.sc/tzbfyx>
 - <https://prnt.sc/tzbg83>
 - <https://bitpay.com/insight/#/BTC/mainnet/tx/cc29b6fd26b919b18f5a5663207f38a569d23e0f2f4bd6b3fb92b9a9444aff22>
 7. [REDACTED]
 - <https://prnt.sc/tzbgwf>
 - <https://prnt.sc/tzbh5t>
 - <https://bitpay.com/insight/#/BTC/mainnet/tx/309bd258949681ce32594dd0305f13a8e53b086e628d68c9e0ba2560443b9ee4>
 8. [REDACTED]
 - <https://prnt.sc/tzbi0g>
 - <https://prnt.sc/tzbi3y>
 - <https://prnt.sc/tzbi0c>
 - <https://prnt.sc/tzbien>
 - <https://prnt.sc/tzbi0b>
 - <https://prnt.sc/tzbi0b>
 9. [REDACTED]
 - <https://prnt.sc/tzbi0c>

- <https://prnt.sc/tzbjft>

10. [REDACTED] – does not belong to us

11. [REDACTED]
[REDACTED]

- <https://prnt.sc/tzbl4p>

- <https://prnt.sc/tzbl7h>

12. [REDACTED]

- <https://prnt.sc/tzbm0f>

- <https://prnt.sc/tzbm9f>

13. [REDACTED]

- <https://prnt.sc/tzbmq4>

- <https://prnt.sc/tzbmsu>

- Paypal [REDACTED]

EXHIBIT 21

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment



English

Sign in



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Google Pixel 4a

Get more, pay less than you'd think. Buy the new Google Pixel 4a starting at \$349.



#30277 -



Clients Information

First Name



Last Name



Company Name

Email Address



EMAIL VERIFIED

Address 1



Address 2

City



State/Region



Postcode



Country



Phone Number



Captured with Lightshot

edit image find similar report abuse

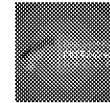


English

Sign in



Download Lightshot for free



End Your Timeshare Now

In Business Since 2010. Nationally Endorsed. Local Area Offices Available As Well.

OPEN

Other Information

Status	Closed
Client Group	None
Signup Date	17/01/2019
Client For	18 Months
Last Login	Date: 17/01/2019 00:39
	IP Address: [REDACTED]
	Host: [REDACTED]
Email Verified	Yes

Captured with Lightshot

[edit image](#) [find similar](#) [report abuse](#)

Switch to Google Chrome for
a better browsing experience.

Yes, get Chrome now

Report misleading ad

Transaction

Transaction Hash 🔗

Summary

Size	225 (bytes)
Fee Rate	42.76 sats/byte
Received Time	January 16, 2019 at 12:45:49 PM GMT-5
Included in Block	<div></div>

Details

🔍

mined on Jan 16, 2019, 12:45:49 PM

→

0.030968 BTC (S)

0.4631028 BTC (S)

FEE 0.0039962 BTC

87510 CONFIRMATIONS

0.4940708 BTC

EXHIBIT 23

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment

CONFIDENTIAL INFORMATION MEMORANDUM

PUBLIC



\$315,000,000 SENIOR SECURED CREDIT FACILITIES

\$15,000,000 SENIOR SECURED REVOLVING CREDIT FACILITY

\$300,000,000 SENIOR SECURED TERM LOAN FACILITY

MARCH 2017



Administrative Agent

Sole Lead Arranger

Sole Bookrunner

SPECIAL NOTICE REGARDING PUBLICLY AVAILABLE INFORMATION

THE COMPANY HAS REPRESENTED THAT THE INFORMATION CONTAINED IN THIS CONFIDENTIAL INFORMATION MEMORANDUM IS EITHER (I) OF A TYPE THAT WOULD BE PUBLICLY AVAILABLE IF THE COMPANY WAS A PUBLIC REPORTING COMPANY OR (II) NOT MATERIAL WITH RESPECT TO SQUARE 2 S.Á.R.L. ("HOLDINGS"), THE COMPANY OR THEIR RESPECTIVE SUBSIDIARIES OR ANY OF THEIR RESPECTIVE SECURITIES FOR PURPOSES OF FOREIGN, UNITED STATES FEDERAL AND STATE SECURITIES LAWS. THE RECIPIENT OF THIS CONFIDENTIAL INFORMATION MEMORANDUM HAS STATED THAT IT DOES NOT WISH TO RECEIVE MATERIAL NON-PUBLIC INFORMATION WITH RESPECT TO HOLDINGS, THE COMPANY OR THEIR RESPECTIVE SECURITIES AND ACKNOWLEDGES THAT OTHER LENDERS HAVE RECEIVED A CONFIDENTIAL INFORMATION MEMORANDUM THAT CONTAINS ADDITIONAL INFORMATION WITH RESPECT TO HOLDINGS, THE COMPANY OR THEIR RESPECTIVE SECURITIES THAT MAY BE MATERIAL. NEITHER THE COMPANY, THE ARRANGER, NOR ANY OF THEIR RESPECTIVE AFFILIATES TAKE ANY RESPONSIBILITY FOR THE RECIPIENT'S DECISION TO LIMIT THE SCOPE OF THE INFORMATION IT HAS OBTAINED IN CONNECTION WITH ITS EVALUATION OF THE COMPANY OR THE FACILITIES.



B. Transaction summary

Q Technologies is seeking to refinance the remaining balance of its existing \$33 million senior secured term loan, prefund potential acquisitions, pay a dividend to existing shareholders, pay fees and expenses associated with the transaction and fund general corporate purposes. The Company's new senior secured credit facilities will include a \$15 million revolver (the "Revolver") and a \$300 million first lien term loan facility (the "Term Loan", and together with the Revolver, the "Credit Facilities"). Pro forma gross and net leverage at close will be 4.1x and 3.4x, respectively, based on LTM 12/31/16 Adj. EBITDA of \$74 million.

Summary of proposed terms:

(\$ in millions)

Facility	Amount	Margin (bps)	LIBOR Floor	Upfront fee / Issue price	Tenor
Revolver	\$15	TBD	NA	TBD	5 years
Term loan	\$300	TBD	1.00%	TBD	6 years

Sources and uses

(\$ in millions)

Sources	Amount	Uses	Amount
First lien term loan	\$300	Distribution to shareholders / prefunding of acquisitions ⁽¹⁾	\$290
Cash from balance sheet	30	Refinance existing debt	33
		Estimated financing fees and OID	8
Total sources	\$330	Total uses	\$330

(1) A portion of the net proceeds may be used to fund acquisitions, and if not ultimately utilized, may be distributed to shareholders.

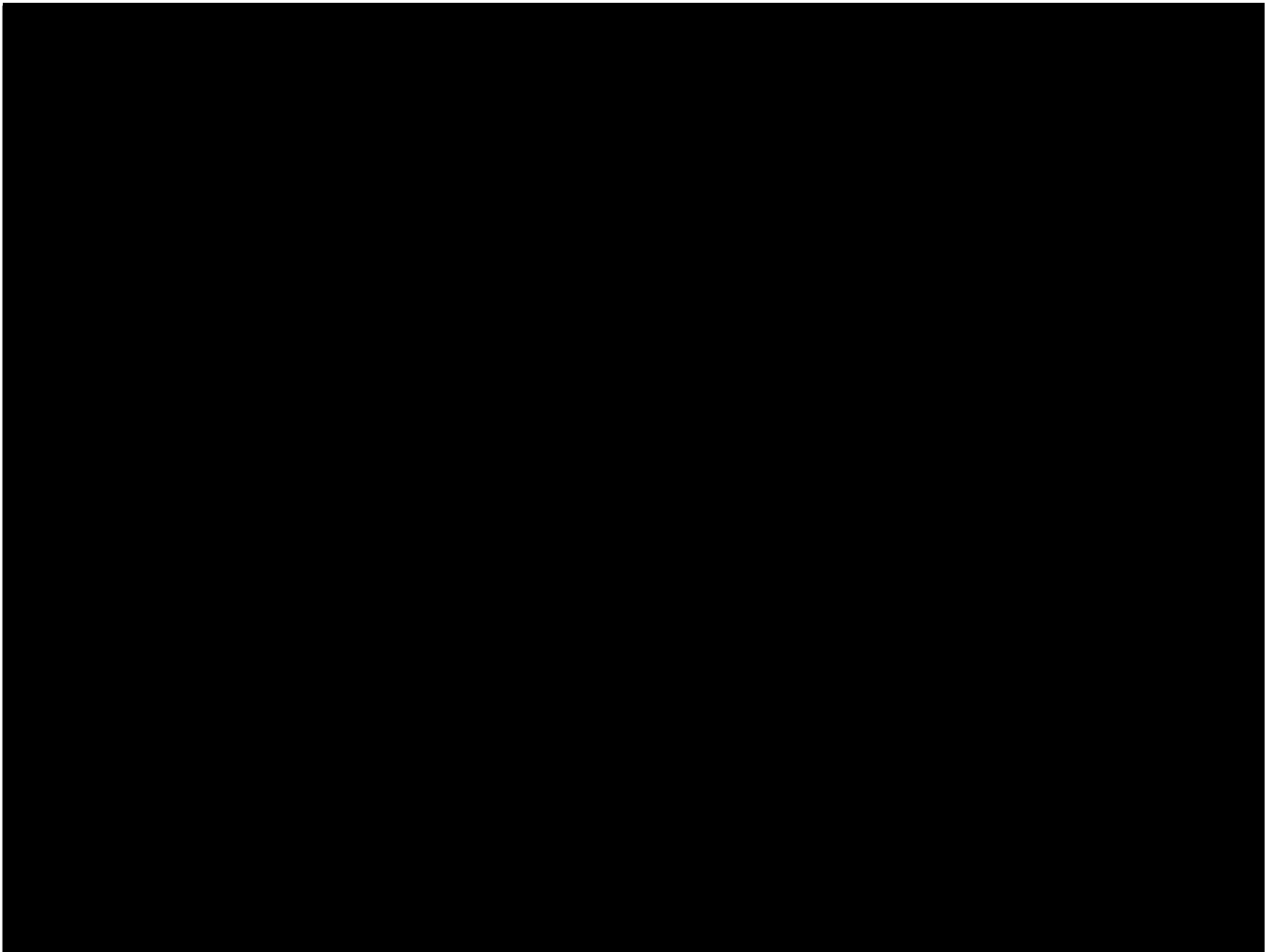
Pro forma capitalization

(\$ in millions)

	As of 12/31/16		
	Actual	Adj.	Pro forma
Cash and cash equivalents	\$80	(\$30)	\$50
\$15 million revolver	—	—	—
First lien term loan	—	300	300
Existing indebtedness	33	(33)	—
Total debt	\$33		\$300
Operating statistics:			
LTM Adj. EBITDA	\$74	—	\$74
Net cash interest expense	NA	—	20
Capital expenditures	2	—	2
Credit statistics:			
Total debt / Adj. EBITDA	0.4x		4.1x
Net debt / Adj. EBITDA	(0.6x)		3.4x
Adj. EBITDA / Net cash interest expense	NA		3.6x
(Adj. EBITDA - Capex) / Net cash interest expense	NA		3.5x



C. Ownership and legal structure





D. Summary of indicative terms

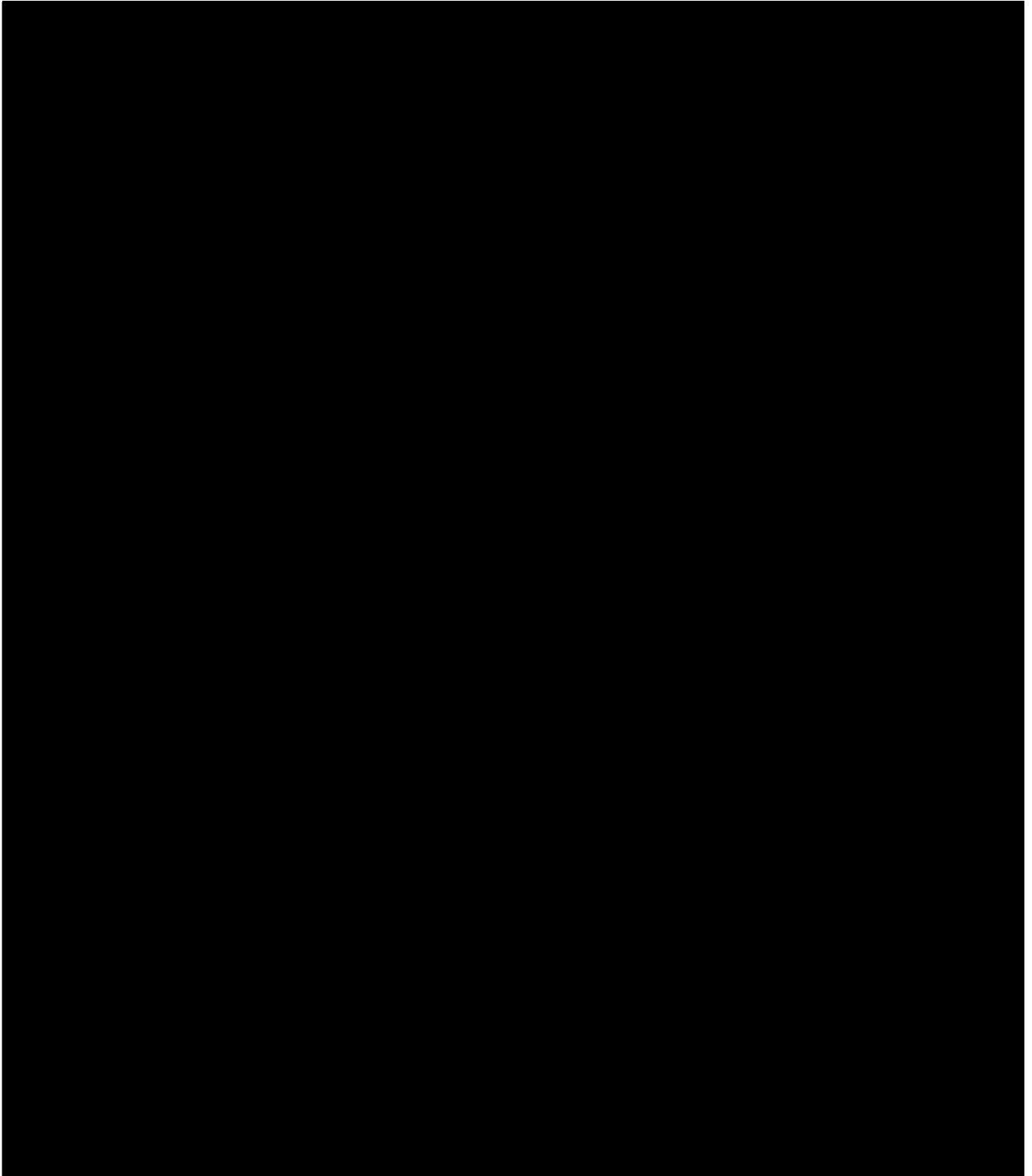


EXHIBIT 25

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment

Q Technologies

Lender Presentation

MARCH 2017



Sponsor Overview



Background

- Founded in 1999, Francisco Partners (“FP”) is a leading global private equity firm focused exclusively on investments in technology and technology-enabled services businesses
- Francisco Partners has a long track record of instituting operational changes to drive value in high IP, market-leading software companies
- Focus on transaction values ranging from \$50 million to over \$2 billion across a wide range of transaction types
 - Extensive experience in the security software space, including companies with operations in Israel
- Over \$10 billion in capital commitments raised across five funds
- Completed more than 175 transactions across portfolio companies and follow-on acquisitions

Representative Investments



Francisco Partners continues to play an integral role in Q's development

- Under the stewardship of Francisco Partners, Q has benefited from a number of strategic, operational and leadership initiatives

Initiatives Undertaken to Build the Platform (2014-2016)

- Expanded senior management team with newly appointed CEO, CFO, Head of Sales, General Counsel, Head of HR, and Head of Services
- Established formal ethics committee, created a U.S. advisory board and strengthened FCPA policies
- Consolidated sales team and process into its current organized structure
- Diversified revenue through development of more products and focusing on more geographies
- Increased focus on recurring revenue via maintenance and term license contracts
- Significantly enhanced security through investment in the Company's network infrastructure and education and training of employees
- Instituted formal business practices including quarterly reporting and annual budgeting

Initiatives Undertaken for Further Growth (2017+)

- Expanding sales force to begin proactively marketing new and existing products
- Opened new sales office in the U.S. to drive efforts to penetrate the U.S. market
- Identifying and evaluating new add-on and strategic M&A opportunities
- Focusing on alternative use cases for the product, e.g., prisons, border control, etc.
- Launching new products that significantly expand the total addressable market

Francisco Partners has created significant value for Q since its investment in 2014 and remains committed to the Company's long-term success

Company Introduction



EXHIBIT 28

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment

From: ryanzinke [ryanzinke@yahoo.com]
Sent: 25/07/2019 14:27:37
To: Dan Ben Dov [/o=First Organization/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e7816e4eda84407fa71cc231f7d367a3-Dan B]; Tomer Timor [/o=First Organization/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d550c13d0f684983b5fac075c4f4353e-Tomer]; Terry DiVittorio [/o=First Organization/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=af4a09b7acab481184e2cde2bcea1e82-Terry]
Subject: Re: NSO-US Market

Ben, I am delighted to hear from you. I am in the Eastern Med on a small boat until Aug 11. I would like to schedule a call as soon as we return and look forward to a discussion regarding how I can be helpful in expanding your business. All the best, Z

Sent from my Verizon, Samsung Galaxy smartphone

----- Original message -----

From: Dan Ben Dov <DanB@NSOGROUP.COM>
Date: 7/25/19 16:58 (GMT+03:00)
To: ryanzinke@yahoo.com, Tomer Timor <TomerT@q.co>, Terry DiVittorio <TerryD@q.co>
Subject: NSO-US Market

Hey Ryan,

Good talking to you today my friend!

Following our WhatsApp correspondence and telephone call I would like to introduce to you Tomer Timor, NSO's VP for Strategic Markets and Terry DiVittorio, President of NSO office in the US.

!3

EXHIBIT 35

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment

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Page 1

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
OAKLAND DIVISION

-----X
WHATSAPP INC. :
a Delaware corporation, and :
META PLATFORMS INC., :
a Delaware Corporation :
Plaintiffs, :
v. : Case No.
NSO GROUP TECHNOLOGIES LTD. : 4:19-cv-07123-PJH
and :
Q CYBER TECHNOLOGIES LTD., :
Defendants. :
-----X

Deposition of SARIT BIZINSKY GIL
LONDON
FRIDAY, SEPTEMBER 6TH, 2024
8:19 A.M. BST

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<p style="text-align: right;">Page 62</p> <p>1 A. So sales are the sales reps that actually connect or try 2 to find those potential end users, potential agencies, 3 government agencies; and the presales are a team that 4 accompanies the sales whenever there is a demo to be 5 done to the potential customer. 6 Q. Got it. Once the contract is signed, then the customer 7 starts working with client executives, is that right? 8 A. Yes. 9 Q. Okay. Going on to the next page: 10 "Our sales force has expanded over time." 11 Do you see that? 12 A. Yes. 13 Q. Does this slide include resellers, finders, and agents, 14 do you remember? 15 A. No, it does not. 16 Q. It does not? 17 A. It includes only the sales reps of the company. 18 Q. Got it. 19 The next slide is "business partners overview". Do 20 you see that? 21 A. Yes. 22 Q. Does "business partners overview" include resellers, 23 agents, and finders? 24 A. This should include only agents and finders, because it 25 represents the commission that we paid.</p>	<p style="text-align: right;">Page 64</p> <p>1 A. But for us it doesn't matter. 2 Q. And when a reseller sells for, let's say -- 3 I understand. 4 So any additional income received by the reseller 5 would not be accounted for by defendants, is that right? 6 A. Yes. 7 Q. What about in the case of WestBridge, as of 2018? Did 8 WestBridge have its own books, so to speak? 9 MR. CRAIG: Objection. Foundation. 10 A. I don't know. 11 Q. Okay. But any booking that WestBridge did would be 12 included in the booking information that's -- the 13 defendants' booking information, right? 14 MR. CRAIG: Object to form. 15 A. I believe so, yes. 16 Q. Okay. But it would not be -- this slide on business 17 partners is just finders and agents, right? 18 A. Yes. 19 Q. Okay. 20 The next slide is -- I want it go forward to 737. 21 A. Okay. 22 Q. Is this what you were talking about when you talked 23 about the pipeline? 24 A. Yes. 25 Q. Okay. And the total -- I will just read from the slide.</p>
<p style="text-align: right;">Page 63</p> <p>1 Q. So agents and finders would earn a commission but 2 resellers would not? 3 A. Resellers mark up our price. As I explained, we do the 4 deal with the reseller and then the reseller signs with 5 the end user. 6 Q. How -- as of May 2018, can you explain how defendants 7 accounted for reseller markups? 8 A. There is a limit of the markup that we sign them on the 9 reseller appointment letter, and -- yes. 10 Q. And if a reseller sold a product, let's say for 11 a million dollars, and got to keep 5 percent, would that 12 5 percent be a cost of the company? I am just trying to 13 understand how that factored into the company's overall 14 accounting. 15 A. No, so to explain you the difference between agent, 16 finders, and resellers, so if it is a deal of -- if we 17 do a deal directly with the end user, and the deal is on 18 1 million, and we pay 5 percent commission to the agent, 19 then the booking is 1 million and the net booking is 20 1 million minus 5 percent. While, if it is a deal with 21 a reseller, if the deal is 1 million, the booking and 22 net booking is 1 million, and, assuming this reseller 23 took 5 percent, it means that his agreement with the end 24 user was on 1.05, with the additional 5 percent. 25 Q. I understand.</p>	<p style="text-align: right;">Page 65</p> <p>1 So under "pipeline process" it says: 2 "Total raw pipeline - scrubbed top to bottom 3 annually for quota/planning purposes though updated in 4 Salesforce codename on an ongoing basis." 5 Is that correct? Did I read that right? 6 A. Yes. It is mostly bottom up. But, yes. 7 Q. Okay. 8 A. It is the entire raw pipeline, like the entire 9 opportunities that we had at that particular time. 10 Q. So, you would know -- starting with the total raw 11 pipeline, you would know every potential customer that 12 might be in the pipeline? 13 A. Yes. 14 MR. CRAIG: Object to form. 15 Q. And all of those customers were in Salesforce, correct? 16 A. Yes. 17 Q. And this would include customers that were in 18 jurisdictions where you had resellers, or jurisdictions 19 where you had agents, and jurisdictions where you had 20 finders; it is everybody, right? 21 A. Yes. And also where we didn't have any of this. 22 Q. Got it. 23 A. Most of the deals were direct deals. 24 Q. Got it. 25 Then we go to qualify pipeline. Qualify pipeline</p>

17 (Pages 62 - 65)

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<p style="text-align: right;">Page 66</p> <p>1 is:</p> <p>2 "Opportunities that have been reviewed and discussed</p> <p>3 with head of sales, and has a good probability of</p> <p>4 happening within the year."</p> <p>5 Is that right?</p> <p>6 A. Yes.</p> <p>7 Q. So some subset of the total raw pipeline is in the</p> <p>8 qualified pipeline, right?</p> <p>9 A. Yes.</p> <p>10 Q. And that requires another review and discussion of, is</p> <p>11 this potential customer -- does it have a good</p> <p>12 probability of happening within the year, right?</p> <p>13 A. Yes.</p> <p>14 Q. So it is another check on are we likely to sell our</p> <p>15 product into this market, right?</p> <p>16 A. Yes.</p> <p>17 Q. Okay. And then you have a third level, which is</p> <p>18 internal target, and it says:</p> <p>19 "On daily basis we monitor the opportunities and</p> <p>20 split into high probability versus medium probability.</p> <p>21 These are deals that can close within the year and which</p> <p>22 sales team has as part of their 'commit'."</p> <p>23 Did I read that right?</p> <p>24 A. Yes.</p> <p>25 Q. And this is a third level of review of a potential</p>	<p style="text-align: right;">Page 68</p> <p>1 A. Yes.</p> <p>2 Q. Okay. And this includes customers and geographies that</p> <p>3 are being targeted by resellers?</p> <p>4 A. Also by resellers, yes.</p> <p>5 Q. Okay. And is this a key piece of information for to you</p> <p>6 keep as part of your job?</p> <p>7 A. Yes.</p> <p>8 Q. And it is accurate on a day to day basis?</p> <p>9 A. Yes.</p> <p>10 Q. And before any sale or contract can be entered into, it</p> <p>11 is likely that it passes through this pipeline, right?</p> <p>12 A. Yes.</p> <p>13 Q. Are you aware of any customer not passing through this</p> <p>14 pipeline?</p> <p>15 A. No. This is the way we monitor, and the way we monitor</p> <p>16 the pipeline and assess each opportunity, if it can be</p> <p>17 qualified and if it is in the, what is called here the</p> <p>18 internal target, meaning that we believe we can close it</p> <p>19 within the year.</p> <p>20 Q. As of May 2018, how many people at defendants were</p> <p>21 involved in this process of monitoring how customers</p> <p>22 went through this pipeline?</p> <p>23 MR. CRAIG: Objection. May lack foundation.</p> <p>24 A. How many people were monitoring it?</p> <p>25 Q. Mm-hm.</p>
<p style="text-align: right;">Page 67</p> <p>1 market. Is it a potential market or a potential</p> <p>2 customer, or both?</p> <p>3 MR. CRAIG: Object to form.</p> <p>4 A. It's the -- as it says here, it is the potential of all</p> <p>5 the customers that can be potentially closed, or won,</p> <p>6 within this particular year.</p> <p>7 Q. So it could be multiple potential customers in the same</p> <p>8 country?</p> <p>9 A. Could be.</p> <p>10 Q. Okay. Got it. So when I talk about -- when this slide</p> <p>11 says "internal target", it is a third level of review of</p> <p>12 a potential customer in the country, right?</p> <p>13 A. Again, sorry?</p> <p>14 Q. It is the third level review. It starts with the total</p> <p>15 raw pipeline --</p> <p>16 A. Yes.</p> <p>17 Q. -- which you scrub annually. Then it is the qualified</p> <p>18 pipeline, which you review and discuss with the head of</p> <p>19 sales. And then it is the internal target. So it is</p> <p>20 the third level, right?</p> <p>21 A. Yes.</p> <p>22 Q. And this is monitored on a daily basis?</p> <p>23 A. Yes.</p> <p>24 Q. So you know every day exactly what customers and</p> <p>25 geographies the company's targeting?</p>	<p style="text-align: right;">Page 69</p> <p>1 MR. CRAIG: Well, that's a different question.</p> <p>2 A. So it is my team that was monitoring it. And, as it is</p> <p>3 written here, together with the head of sales in each</p> <p>4 region -- because you do it on a region basis in order</p> <p>5 to see the entire picture -- and together with the CBO,</p> <p>6 of course. So these are the people who are monitoring</p> <p>7 it.</p> <p>8 Q. So, if a customer was in the -- let's say had you</p> <p>9 a potential customer in the United States. They would</p> <p>10 start in the total raw pipeline?</p> <p>11 MR. CRAIG: Objection. Foundation.</p> <p>12 A. Yes.</p> <p>13 Q. And then that would be scrubbed, top to bottom, for</p> <p>14 quota or planning purposes. So that's the first step</p> <p>15 for that customer, right?</p> <p>16 MR. CRAIG: Objection. Vague.</p> <p>17 A. What do you mean?</p> <p>18 Q. Well, we talked about the process that you did to create</p> <p>19 the total raw pipeline. That same process would apply</p> <p>20 to a potential law enforcement customer in the</p> <p>21 United States?</p> <p>22 MR. CRAIG: Same objection.</p> <p>23 A. Yes.</p> <p>24 Q. And then they would go in to the qualified pipeline, so</p> <p>25 they would be reviewed and discussed with the head of</p>

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<p style="text-align: right;">Page 86</p> <p>1 agencies?</p> <p>2 MR. CRAIG: Hold on.</p> <p>3 Yeah, I don't think you can answer that without</p> <p>4 revealing information about a customer.</p> <p>5 A. Okay. I cannot answer.</p> <p>6 Q. Do you know -- you know that Mr. Shohat was deposed,</p> <p>7 correct?</p> <p>8 A. Yes.</p> <p>9 Q. You know that, in Mr. Shohat's deposition, he told us</p> <p>10 that the FBI was a customer of defendants?</p> <p>11 MR. AKROTIRIANAKIS: That's not true. We can look at the</p> <p>12 transcript if you want.</p> <p>13 MR. MARZORATI: Okay. We can skip this.</p> <p>14 By Mr. Marzorati:</p> <p>15 Q. Throughout 2018 and 2019 you were in your role as VP of</p> <p>16 global business operations, correct?</p> <p>17 A. Again, when?</p> <p>18 Q. In 2018 and 2019 you were director of --</p> <p>19 A. Director.</p> <p>20 Q. Okay. And that involved an understanding of defendants'</p> <p>21 products generally, right?</p> <p>22 A. As I said before, only to the extent of, as I said,</p> <p>23 covert vectors, and triggered vectors.</p> <p>24 Q. And you remained generally aware that there were</p> <p>25 different vectors for products?</p>	<p style="text-align: right;">Page 88</p> <p>1 a zero click vector, have any impact on defendants'</p> <p>2 forecasts?</p> <p>3 A. Again, sorry?</p> <p>4 Q. Did the development of this zero click vector for</p> <p>5 Android in early 2018 have any impact on defendants'</p> <p>6 forecasts?</p> <p>7 MR. CRAIG: Object to form.</p> <p>8 A. Err, not necessarily.</p> <p>9 Q. What do you mean "not necessarily"?</p> <p>10 A. It means that I cannot say that we sold more or less</p> <p>11 because of these specific vectors.</p> <p>12 Q. My question wasn't about sales, it was about -- I wanted</p> <p>13 to first talk about forecasts.</p> <p>14 A. Yes, but ...</p> <p>15 Q. Same answer?</p> <p>16 A. Yeah.</p> <p>17 Q. Did you make any changes to the forecast as a result of</p> <p>18 the vector?</p> <p>19 A. No.</p> <p>20 Q. Did you understand, in December 2018, that Heaven</p> <p>21 stopped working?</p> <p>22 A. I don't know.</p> <p>23 Q. You don't know or you don't remember?</p> <p>24 A. Um, I don't remember.</p> <p>25 Q. Okay. Have you ever heard of an installation vector</p>
<p style="text-align: right;">Page 87</p> <p>1 A. Yes.</p> <p>2 Q. Yes. Do you remember hearing about a breakthrough in</p> <p>3 installation vectors in 2018 or 2019? That the company</p> <p>4 had a breakthrough?</p> <p>5 MR. CRAIG: Objection. Vague.</p> <p>6 A. Yeah, what do you mean by breakthrough?</p> <p>7 Q. Do you remember hearing about any breakthrough with</p> <p>8 respect to an installation vector?</p> <p>9 MR. CRAIG: Objection. Vague.</p> <p>10 A. I don't remember.</p> <p>11 Q. Okay. Are you aware that defendants developed a zero</p> <p>12 click vector for Android in early 2018?</p> <p>13 A. Yes.</p> <p>14 Q. Okay, and you are aware that's sometimes referred to</p> <p>15 internally as Hummingbird?</p> <p>16 A. Yes.</p> <p>17 Q. Okay. And that there is an installation vector called</p> <p>18 Heaven? Are you aware that defendants developed an</p> <p>19 installation vector called Heaven in early 2018?</p> <p>20 A. I heard the name.</p> <p>21 Q. Do you know how Heaven worked?</p> <p>22 A. No.</p> <p>23 Q. Did you know that it used WhatsApp?</p> <p>24 A. No.</p> <p>25 Q. Okay. Did the development of an installation vector, of</p>	<p style="text-align: right;">Page 89</p> <p>1 referred to as Eden, or Eden?</p> <p>2 A. Yes.</p> <p>3 Q. What's your understanding of Eden?</p> <p>4 A. Again, another covert Android vector.</p> <p>5 Q. Okay.</p> <p>6 A. From my perspective.</p> <p>7 Q. And who told you about Eden?</p> <p>8 MR. CRAIG: Object to form.</p> <p>9 A. No one in particular. I mean, the name was used in the</p> <p>10 company, so I heard the name. But, from a sales</p> <p>11 perspective, we call it "covert Android" or</p> <p>12 "Hummingbird", which was the name towards customers for</p> <p>13 covert -- of covert Android vectors. So we never used</p> <p>14 these internal names.</p> <p>15 Q. Okay.</p> <p>16 I want to focus on 2017, which is the period when</p> <p>17 you joined. Did defendants tell customers that they had</p> <p>18 a covert vector for Android?</p> <p>19 MR. CRAIG: Objection. Calls for speculation.</p> <p>20 A. Again, what was the question?</p> <p>21 Q. In 2017 did defendants tell their customers, or</p> <p>22 potential customers, that there was a covert vector for</p> <p>23 Android?</p> <p>24 A. I don't know.</p> <p>25 Q. Okay. Do you remember that being used in internal</p>

23 (Pages 86 - 89)

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<p style="text-align: right;">Page 90</p> <p>1 materials?</p> <p>2 MR. CRAIG: Objection. Vague.</p> <p>3 A. I don't know.</p> <p>4 Q. Did you ever talk to customers?</p> <p>5 A. Um, not about that.</p> <p>6 Q. Okay. What would you talk to them about?</p> <p>7 A. I am not sure I can say.</p> <p>8 Q. Are you not allowed to say under Israeli law?</p> <p>9 A. Yes.</p> <p>10 (Exhibit 2003 marked for identification)</p> <p>11 Q. Okay. I want to show you a document that has previously</p> <p>12 been marked as exhibit 2003.</p> <p>13 MR. CRAIG: Thank you.</p> <p>14 Q. And for the record, this is a document with Bates stamp</p> <p>15 DIVITTORIO_WhatsApp_00000058. I will represent to you</p> <p>16 that this is the way that WhatsApp messages are produced</p> <p>17 in litigation.</p> <p>18 A. Okay.</p> <p>19 Q. So this is a WhatsApp message.</p> <p>20 A. Okay.</p> <p>21 Q. And I will let you read the document, but I want to give</p> <p>22 you a flag on the first message, which is -- this is the</p> <p>23 way the document was produced to us by your lawyers, but</p> <p>24 I understand, knowing no Hebrew myself, that --</p> <p>25 A. Yes, it is like --</p>	<p style="text-align: right;">Page 92</p> <p>1 A. Yes.</p> <p>2 Q. And you communicate with other people who work for</p> <p>3 defendants via the WhatsApp app on your phone?</p> <p>4 A. Yes.</p> <p>5 Q. And you used the normal -- you downloaded it from the</p> <p>6 App Store? Tell me how you got the WhatsApp app on your</p> <p>7 phone?</p> <p>8 A. It was so many years ago, I don't remember.</p> <p>9 Q. Do you remember agreeing to the terms of service?</p> <p>10 MR. CRAIG: Objection. Legal conclusion.</p> <p>11 A. I don't think I read it.</p> <p>12 Q. Okay. Whatever you needed to do to install it, you did</p> <p>13 it?</p> <p>14 A. Okay, yes.</p> <p>15 Q. So this is a WhatsApp message that was sent to a group</p> <p>16 of participants, including you, is that correct?</p> <p>17 A. Yes. This is what I see, what I read here.</p> <p>18 Q. And the date is January 31, 2019, right?</p> <p>19 A. This is what I read.</p> <p>20 Q. Okay, but you don't remember this WhatsApp message?</p> <p>21 A. No.</p> <p>22 Q. Okay. But you have no reason to doubt that you actually</p> <p>23 received this message, right?</p> <p>24 A. Yes.</p> <p>25 Q. Okay. I understand that the first message is, in the</p>
<p style="text-align: right;">Page 91</p> <p>1 Q. -- it may be difficult to read.</p> <p>2 A. Yes, it is difficult to read.</p> <p>3 Q. Okay.</p> <p>4 The first name under "other recipients", at the top,</p> <p>5 is that you and your WhatsApp number?</p> <p>6 MR. CRAIG: Objection. Vague.</p> <p>7 A. Yeah, I can see my number and my name.</p> <p>8 Q. [REDACTED] ?</p> <p>9 A. Yes.</p> <p>10 Q. Okay. Do you use that WhatsApp number for work</p> <p>11 purposes?</p> <p>12 A. Yes.</p> <p>13 Q. Okay.</p> <p>14 MR. CRAIG: Sorry, Luca, I just want to note here for the</p> <p>15 record, again, that we are continuing to designate this</p> <p>16 transcript highly confidential, attorneys' eyes only.</p> <p>17 Especially in light of now containing her personal phone</p> <p>18 number.</p> <p>19 Q. Okay.</p> <p>20 Do you have another WhatsApp account that you use</p> <p>21 for personal or do you have just one WhatsApp account?</p> <p>22 A. Should I answer?</p> <p>23 MR. CRAIG: Yes.</p> <p>24 A. I have only this one.</p> <p>25 Q. Okay. Do you have the WhatsApp app on your phone?</p>	<p style="text-align: right;">Page 93</p> <p>1 way that your lawyers gave it to us, a little garbled.</p> <p>2 But I am going to try to summarize what it says, and you</p> <p>3 can tell me if that's kind of what it says, is that</p> <p>4 alright?</p> <p>5 MR. CRAIG: Well, you have a translator here that I think is</p> <p>6 in a much better position to do that than the witness</p> <p>7 is.</p> <p>8 THE INTERPRETER: I can read it in the Hebrew.</p> <p>9 MR. MARZORATI: Okay.</p> <p>10 THE INTERPRETER: Okay.</p> <p>11 A. Okay.</p> <p>12 By Mr. Marzorati:</p> <p>13 Q. Do you understand, generally, what this message means or</p> <p>14 is it incomprehensible?</p> <p>15 A. No, it is understandable.</p> <p>16 Q. Great. This is announcing that the Eden installation</p> <p>17 vector has been developed for Android, is that right?</p> <p>18 Eden for Android?</p> <p>19 MR. CRAIG: Objection to form.</p> <p>20 A. This is what I read.</p> <p>21 Q. Okay. And it was scheduled for deployment in</p> <p>22 early February?</p> <p>23 A. This is what I read here.</p> <p>24 Q. And at the end of the message it says something like</p> <p>25 "great success"?</p>

24 (Pages 90 - 93)

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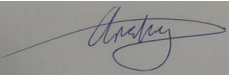
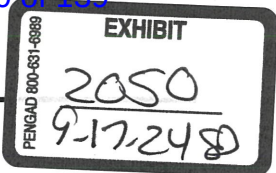
<p style="text-align: right;">Page 246</p> <p>1 CERTIFICATE OF COURT REPORTER</p> <p>2 I, CHRIS LANG, an Accredited Real-time Reporter, hereby</p> <p>3 certify that the testimony of the witness SARIT GIL in the</p> <p>4 foregoing transcript, taken on this 6TH day of SEPTEMBER,</p> <p>5 2024 was recorded by me in machine shorthand and was</p> <p>6 thereafter transcribed by me; and that the foregoing</p> <p>7 transcript is a true and accurate verbatim record of the</p> <p>8 said testimony.</p> <p>9</p> <p>10 I further certify that I am not a relative, employee,</p> <p>11 counsel or financially involved with any of the parties to</p> <p>12 the within cause, nor am I an employee or relative of any</p> <p>13 counsel for the parties, nor am I in any way interested in</p> <p>14 the outcome of the within cause.</p> <p>15 </p> <p>16</p> <p>17 Name: CHRIS LANG</p> <p>18 Date: 9/6/24</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>	<p style="text-align: right;">Page 248</p> <p>1 WHATSAPP INC., et al. vs.</p> <p>NSO GROUP TECHNOLOGIES LTD. et al.</p> <p>2 9/6/2024 - SARIT BIZINSKY GIL</p> <p>3 E R R A T A S H E E T</p> <p>4 PAGE____ LINE____ CHANGE____</p> <p>5 _____</p> <p>6 REASON_____</p> <p>7 PAGE____ LINE____ CHANGE____</p> <p>8 _____</p> <p>9 REASON_____</p> <p>10 PAGE____ LINE____ CHANGE____</p> <p>11 _____</p> <p>12 REASON_____</p> <p>13 PAGE____ LINE____ CHANGE____</p> <p>14 _____</p> <p>15 REASON_____</p> <p>16 PAGE____ LINE____ CHANGE____</p> <p>17 _____</p> <p>18 REASON_____</p> <p>19 PAGE____ LINE____ CHANGE____</p> <p>20 _____</p> <p>21 REASON_____</p> <p>22 _____</p> <p>23 _____</p> <p>24 SARIT BIZINSKY GIL Date _____</p> <p>25</p>
<p style="text-align: right;">Page 247</p> <p>1 WHATSAPP INC., et al. vs.</p> <p>NSO GROUP TECHNOLOGIES LTD. et al.</p> <p>2 9/6/2024 - SARIT BIZINSKY GIL</p> <p>3 ACKNOWLEDGEMENT OF DEPONENT</p> <p>4 I, SARIT BIZINSKY GIL , do hereby declare that I</p> <p>5 have read the foregoing transcript, I have made</p> <p>6 any corrections, additions, or changes I deemed</p> <p>7 necessary as noted on the Errata to be appended</p> <p>8 hereto, and that the same is a true, correct and</p> <p>9 complete transcript of the testimony given by me.</p> <p>10</p> <p>11 _____</p> <p>12 SARIT BIZINSKY GIL Date _____</p> <p>13 *If notary is required</p> <p>14 SUBSCRIBED AND SWORN TO BEFORE ME THIS</p> <p>15 _____ DAY OF _____, 20____.</p> <p>16</p> <p>17</p> <p>18 _____</p> <p>19 NOTARY PUBLIC</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>	<p style="text-align: right;">Page 248</p>

EXHIBIT 37

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment



Message

From: Charles Fridrich [cfridrich@e-telsystems.com]
Sent: 3/23/2017 7:18:49 PM
To: Ed Allen [eallen@e-telsystems.com]; Chris Willingham [cwillingham@e-telsystems.com]
CC: Barbara Burgess [bburgess@e-telsystems.com]
Subject: RE: Westbridge IT

Ed / Chris,

Need help quoting the 2 Dell server spec listed below, at your earliest possible convenience, please. If you have an alternative suggestions, let me know.

Thanks,
 Chuck

From: Nir Rothenberg [mailto:NirR@nsogroup.com]
Sent: Tuesday, March 21, 2017 9:37 AM
To: Charles Fridrich <cfridrich@e-telsystems.com>; Oren Westbrg <oren@westbrg.com>
Cc: Yochanan Sharon <yochanans@nsogroup.com>; Valery Levchenko <ValeryL@nsogroup.com>; Alexey Baltacov <AlexeyB@nsogroup.com>; Lior Zagury <LiorZ@nsogroup.com>; 'Terry Divittorio' <TerryD@qtechnologies.com>; Josh Shaner <JoshS@nsogroup.com>
Subject: RE: Westbridge IT

Hi Charles,

In continuation to my e-mail from last night, I'd like to elaborate regarding the servers I mentioned. Please provide us with a quote for 2 servers containing the following specifications:

Module	Description
PowerEdge R730	PowerEdge R730, Intel® Xeon® E-26XXv3 Processors
Chassis Configuration	Chassis with up to 12+4 LFF Hard Drives + 2 Cage OSD
Processor	2x Intel® Xeon® E5-2650v3 2.30GHz, 25M Cache, 9.6GT/s QPI, Turbo, HT, 10C, 105W, Max Mem 2133MHz
Memory Capacity	256GB 8x 32GB RDIMM, 2400MT/s, Low Volt, Dual Rank, x4 Data
RAID Controller	PERC H730 2GB Integrated RAID Controller
Hard Drives	2x 300GB 10K RPM SAS 12Gbps 2.5in HDD – for OS
	12x 4TB 7.2K RPM SATA 6Gbps 3.5in HDD – for Data & File
	Internal Dual SD Module 2x16GB SD Card – VM Hypervisor
Select Network Adapter	QLogic 57810 Dual Port 10Gb Base-T Network Adapter
Systems Management	iDRAC8 Enterprise
Power Supply	Dual, Hot-plug, Redundant Power Supply (1+1), 750W
Warranty & Service	3Yr Basic Hardware Warranty Repair NBD Onsite

Thanks,
 Nir

From: Nir Rothenberg
Sent: Monday, March 20, 2017 11:21 PM
To: Charles Fridrich <cfridrich@e-telsystems.com>; Oren Westbrg <oren@westbrg.com>
Cc: Yochanan Sharon <yochanans@nsogroup.com>; Valery Levchenko <ValeryL@nsogroup.com>; Alexey Baltacov <AlexeyB@nsogroup.com>; Lior Zagury <LiorZ@nsogroup.com>; 'Terry Divittorio' <TerryD@qtechnologies.com>; Josh Shaner <JoshS@nsogroup.com>
Subject: Re: Westbridge IT

Hi Charles,

Thanks for the detailed response. We will definitely consider everything you suggested.

To answer your question, we are setting up a new separate network that will fit our corporate IT standards and will be managed by us.

Thus, although some of the equipment may be what you consider "overkill" for an office the size of Westbridge, it is still important for us to understand the financial implications of locally purchasing the equipment listed by us in the email sent by Oren.

That said, feel free to add quotes for the alternative equipment you suggested as well, so that we will have all the information when we make our decision.

Thanks again and all the best,
 Nir

----- Original message -----

From: Charles Fridrich
Date: Mon, Mar 20, 2017 23:04
To: Oren Westbrg;
Cc: Yochanan Sharon; Valery Levchenko; Alexey Baltacov; Lior Zagury; Nir Rothenberg; 'Terry Divittorio'; Josh Shaner;
Subject: RE: Westbridge IT

Understood. Thanks Oren.

Before I start, I have a few questions. Is this going to be a completely separated network?
 I ask because you've already got switches, firewall, and WiFi AP.

Granted, the firewall you have now is just a simple, small business, SonicWALL TZ300 and could use some beefing up. Palo Alto is an excellent firewall/security option. Also consider, through your current internet provider, Fusion, you could get an equivalent option with Fortinet. They offer a Fortinet NGFW/UTM, managed option. It can be managed by Fusion entirely or by Westbridge IT staff.

You currently have an Avaya 9132 Wireless AP, which is a highly capable AP : Dual Radio, 802.11ac, 2x2 MIMO, Omni-directional Antenna, with Integrated Wireless Controller. If you need more coverage, you'd probably be better off just getting a second Avaya 9132. The Aruba AP-225 is way overkill for your small office and environment.

The Junipers you looking at are very good mid-range enterprise switches too. You do currently have the Avaya ERS 3549GTS-Pwr+. I would recommend adding a second and stacking them. Or upgrading to the ERS 4800 or 4900 series which are comparable, but I can deliver them at a much better price than I can the Junipers.

From: Oren Kaplan [mailto:oren@westbrg.com]
Sent: Monday, March 20, 2017 11:52 AM
To: Charles Fridrich <cfridrich@e-telsystems.com>
Cc: Yochanan Sharon <Yochanans@nsogroup.com>; Valery Levchenko <ValeryL@nsogroup.com>; Alexey Baltacov <AlexeyB@nsogroup.com>; Lior Zagury <LiorZ@nsogroup.com>; Nir Rothenberg <NirR@nsogroup.com>; 'Terry

Divittorio' <TerryD@qtechnologies.com>; Josh Shaner <JoshS@nsogroup.com>

Subject: Westbridge IT

Chuck,

It is time to move to the second phase of our infrastructure need.

I have CC'ed our IT team and we are in need of a quote for the following equipment:

- a. 2 servers: Dell r730 (like our ESXi servers but filled with disks)
- b. 2 switches: Juniper 4300 POE 24 ports
- c. Firewall: 1 Palo Alto 220 POE
- d. 1 Aruba 225 Wi-Fi access point

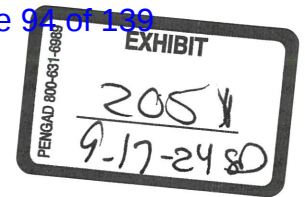
Thanks,

Oren

!3

EXHIBIT 38

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment



Pitch: Happy Flow

Tuesday, August 11, 2015 1:19 PM

Good morning, today I'm gonna show you how our solution - "Pegasus", works. Please feel free to stop me at any point and ask questions.

We are going to do a **live demo** on a live system and install agents on the devices I have here with me, which are equipped with a local SIM card.

< Show the devices >

< Pegasus - Home Screen >

This is Pegasus. I have the system installed on my laptop, while our servers are back in our home country.

This is the **home screen**. Our solution was developed by veterans of elite intelligence agencies and their work is displayed throughout the system and in the home screen as well. Here we have the **10 last active devices** that communicated with our server. This is the first thing the operators see when he logs into Pegasus, so they can know which agent recently sent new information and easily update each other while switching shifts.

On the left side of the screen we can see the **target list**. We classify the targets into 3 levels - The Group, The Target and The Agent:

The **Group** level represents the organization we want to track, for example I have created the group "Terror Group X" for us.

Under it we have the **Target**, which is the individual person we want to track. Let's say "Terrorist 1".

Then we have the **Agents**, which are the devices that are used by our target.

As you know many people use more than just one device. So if my target uses one device to send a message and another to make calls I can easily track all of his communications in one place.

< Show the device you're going to infect >

First I'll demonstrate the installation on an **Android** device - A Galaxy S5 with a 4.4.2 operating system. Android holds about 80% of the market share in the smartphones market.
If you'd like we can start with another platform.

Now, let's say that I'm an operator in the operating room, and after months of search I finally found my target's phone number, and I want to install an agent on his smartphone and gather all of the information we talked about before. With Pegasus the number is all I need in order to infect the device.

I already created a Group and a Target and now I'll add a new Agent.

< Create a New Agent - "Device 1" >

This is the **installation screen**.

< Type in the device phone # and explain and place it by your computer >

I'll type in my target's phone number, choose to extract the data from the device.

< Click the "Extract Data" Button >

And select the sending method OTA (over-the-air), which as explained in the presentation, means the installation will be performed **remotely** and without any **engagement** with the target.

Prior to the installation I am going to perform a lookup called **HLR lookup** which will provide me with information regarding the Country and the Network under which this number is registered.

We can see that this phone is from Israel and is using Orange as an operator. At this time I can also see if the target is **roaming** to a different network.

This information helps the system and me as the operator to determined rather or not the target can be infected at this time.

At this stage I can also get information about the last time the device was connected to the network. For example now I have an indication based on Whatsapp that he was last active on....

This enables me to know two things - First, that my target uses a smartphone, second that it is an active smartphone.

As we said our solution is a sophisticated sensor, but it goes hand in hand with good inelegance work. This information for example can help me, as an operator, to decide if now is the right moment to install the agent.

If, for example it is the middle of the night and I saw that my target was last active 3 hours ago I know it is probably a good time to Install my agent.

I talked a lot but all I really did was to type my target's phone number.

Now I'll simply press install and Pegasus will install the agent on the device, remotely without any engagement with the target.

< Place the device in the center of the table >

I'm going to place the phone in front of you, you don't have to touch it.

In a few seconds you will see a **quick blink** on the screen

< Press Install >

As I press install our servers will send the installation to the device through a chain of VPSs.

[First we install the BH and then the BH installs the agent on the device.]

The installation is totally silent and invisible and cannot be prevented by the target.

< Only after the blink >

This blink is the only indication of the installation.

Imagine you're the target and it's the middle of the night, the phone is placed on the night stand by your bed while you're asleep. The next morning you will wake up and you'd never know an Agent was installed on your device overnight.

At this point you are welcome to use the device, it works normally without a problem. You can send a message or make a phone call.

From this moment on the target can't hide from us, we can track every move he makes.

< Open the Log Screen >

Under the **log screen**, I can monitor the progress of the installation. We can see that the device have browsed to our server.

< Open the Installations Screen >

The first piece of information we receive from the device is it's **user agent**. This is basically the device ID. We can see that our target is using an Samsung S5 device running an Android 4.4.2 OS, and that it browsed to us through chrome. The system uses this information to determine which Pegasus installation package to use.

< Open the Log Screen >

In the **background** the installation has progressed.

Once the Agent is installed information will be retrieved from the device, and we will see **little red dots** showing up on the feature panel at the top of the screen.

There are **two phases** of collecting data from the device:

1. The **initial dump** in which we're receiving everything there is on the device at the time of the installation.
2. The **monitoring phase** in which the agent sends any new piece of information that has been added to the device.

Now can you see the red dots starting to appear?

< Draw attention to the feature panel >

You can also see the counters increasing and counting the amount of information coming from the device.

Now if you don't have any questions we can starts going through the different types of information the agent sent us:

< Open the Contacts Screen and Click on an interesting contact >

Here we can see a list of all the contacts that were **synced by our target** on his device.

For each contact the agent retrieves all the information that was saved, from his full name and phone number to his address and email account.

As you can imagine, the contacts are practically **a gold mine** for intelligence agencies.

If you have the contact list of a central target you can easily, through the contacts list, find numbers of other targets and use Pegasus to track them as well.

For example if I suspect that Mr. X is the number 2 in the organization I can use this information to infect him separately with a different agent.

And thus in just a few clicks I can expand my hold of the organization.

< Open the Messages Screen >

Under the Messages screen we can see all the incoming and outgoing **Text** messages.

In the case of an iPhone we would also see all the target's iMessages in this screen.

< Present the device to the costumer >

You are welcome to try and **send a SMS** and we'll see how it immediately gets into the system.

You can send it to yourself or to me.

In some cases, when the network is a bit slow, we get an update of a sent SMS even before the other side does.

< Open the Emails Screen and click on an email with an attachment >

The next feature I want to show you is the Emails.

Here we have **Email** messages from all the email accounts that are synced with the device - from our target's Gmail, to his Office exchange mail.

< Demonstrate on the email you clicked on >

For each email message we can see the folder under which it was saved, so we can even read through emails that were never sent.

I can read through each email and see to who it was sent to and the content of the email itself.

If an interesting email has an **attachment** we can retrieve it and it will be sent to a sandbox where we can read it.

[We don't automatically retrieve all the attachments as most of them are not relevant and will just overload the sending bandwidth.]

< Open the IM Screen and click on an interesting conversation >

Today going through a target's SMS messages is not even the tip of the iceberg of monitoring the target's communications.

Third party applications are getting more and more popular, and replace the regular text messaging and even phone calls. Think about how many IM you send ever day versus how many calls you make.

Our solution enables you to track all the popular IM applications, from WhatsApp to Viber, Kako Talk and Line. It provides you with access to all the **IM conversations** on the device, even to very secured application such as **Skype, BBM and Telegram** which are encrypted.

If you'll monitor the target from the air you'll not be able to read those conversations, but because our agent is installed on the device itself we don't need to deal with the encryption. The device will de-encrypted the information for us and we will see things as the target sees them.

We can see all the messages divided by apps and by conversations, and can easily read through the conversation as a hole.

Here you can see one conversation and read through it. If our target sent a voice recording message or a picture (like many of us do) it can also be retrieve from the DB.

< Open the Call Log Screen and press Enable >

On the **Call Log screen** we can see all the historical calls on the device, both in and out going. We even get indication of Skype and Viber calls.

And from the point of installation forward we can record all the calls. Once a call is disconnected we can listen to it.

You are welcome to make a call and see how it works.

< Wait for the client to make a call >

In a few seconds we will see a new line at the top of the list with a green play button next to it.

< When the new call appears on the screen >

Now we can listen to the conversation.

< Playback the call to the client >

< Open the Calendar Screen >

As with the emails we have access to all of the **calendars** that are synced on the device.

< Open the Miscellanies Screen >

Additional technical information about the device can be found under the Miscellanies screen. For example:

- Historical WiFi networks, which gives us a list of all the WiFi network the device was connected to, their credentials and locations. This information can tell us where our target has been, in which hotel he spent the night and where he ate his dinner.
- Process List which give us an indication of any third party application our target uses and we didn't think of in advance. For example, if our target uses a new IM App we didn't knew about, the process list can helps us find it and we can access the phone DB to retrieve it's information.
- Browser history and passwords - we have access to all the URL's, user names and passwords the target has inserted on his browser.
- Key Logger - from the moment of installation anything the target types on his device, even without sending it to anyone will be by collected by our agent. Everything that is typed on the device is sent back to the server.

Up until now we've discussed all the information we automatically receive from the target from the moment of installation and through the monitoring phase.

Now I would like to show you some actions we can initiate in order to actively get more information from our agent, and turn the device into a spying tool.

< Open the Location Screen >

First is the target's location.

I can request a location sample and set the sampling rate. The agent will send me the exact GPS location of the target in that exact moment. Our agent is capable of collecting GPS location even if the location services on the device are disabled (the agent can secretly turn them on in order to perform the sample and then turn them off again).

If the GPS location is not available the agent would send us the cellular location.

[The agent uses the Cell IDs the device can transmit to and triangulates their locations to provide a

more accurate location of the target.]

We can also use the location sampling to draw the route of the target's movement from one point to another and thus expands our operations opportunities.

< Open the Camera Screen >

Through the camera feature we can **make our target be our spy everywhere he goes**. We can activate both the front and the back cameras and take a snapshot without leaving any indication on the device - There is no flash or sound and the picture is not saved anywhere on the device.

We can also take a screenshot and see what's on the target's screen.

Let's say for example my target is holding is phone and talking to someone I can, in one click take a snapshot both of him, the person he is talking to and the device itself

< Open the Tap Screen >

So let's say that by now, we read our target's IM know he is planning to meet with his boss. We looked at his calendar and found out when and where they are going to meet, and all that's left is being able to be a fly on the wall during the meeting and listening to whatever is going on.

< Start recording>

For that end our solution includes the Tap feature.

This is a very sensitive feature. It requires the device to be on idle mode, so if you may please put it on idle. The reason for the idle mode is that we want to hide the feature and to make sure our target is not currently using the device.

With one click I can tap the device and hear everything in the target surroundings.

In a few seconds we're going to hear me in a very bad eco.

We can listen to the Tap the recording live, or we can listen to it offline. We can even export the audio file and further analyze it in any other system.

< Open the Information screen >

Just another thing I wanted to show you, is that under the **device information** we can see:

- The device **current data connection**, which tells us if the device uses WiFi or 3G and can help us decide when to send information from the agent to our server.
- The **battery usage** status - which can alert us if the battery is low and we are going to lose track of our target.
- The **SIM cards history** of the device - the agent sits on the device and enable us to track any SIM change, we will see the targets new phone number.

So far we have seen how much information we can collect from one demo device with only X contacts and Y messages. But as you know we all have much more information on our devices. In order to help operators to get to the crucial information first our solution includes the **Rules & Alerts** feature.

This tool will save your organization time and money by identifying the crucial information arriving from the agent without the need to go through all the raw data.

< Open the Rules & Alerts screen >

I'm going to show you some of the rules I can easily create.

For example we can set a **geo-fencing rule** which will send us an alert every time our target goes in or out of a certain radius\zone. So if I want to know about every time my target comes and leaves the organization HQ I can set a geo-fencing rule. We will see those alerts on the right side of the screen.

We also have the ability to set a rule about the proximity between two targets.

Moreover, let's say I know that all the communications between my target and his boss are interesting to me, I can set a rule to receive an alert every time there is a new communication between them, rather it be via email, IM or a call.

< stay on this screen and sum up >

This was the main flow of our system.

If you have any questions I will gladly answer them at this point.

Identities

Monday, August 17, 2015 5:34 PM

Galaxy S5:

Bettina Bianco

BettinaBianco78@gmail.com

BB3013demo

@BettinaBianco

August 10, 1978

iPhone 5S:

Mark Werner

markwerner78@gmail.com

MW2012demo

@Mark_Wer

August 10, 1978

Ideas

Tuesday, August 11, 2015 3:21 PM

- Film a full demo for training!
- Home Screen - Targets instead of Agents - More interesting for intelligence operator (maybe 2 versions - one with the Agents for people who will be incharge of the infection and another other with Targets)

EXHIBIT 39

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment

EXHIBIT

2045

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z		
1				Total relevant revenue \$	Company Yearly Profit	Total relevant profit \$																						
2			2018	\$ 3,900,371.07	0%	\$ -																						
3			2019	\$ 7,161,342.17	0.9%	\$ 64,452.08																						
4			2020	\$ 4,181,758.15	0%	\$ -																						
5																												
6	Account No.	Deal Type	Q2'2018 Revenue [K\$]	Q3'2018 Revenue [K\$]	Q4'2018 Revenue [K\$]	Q1'2019 Revenue [K\$]	Q2'2019 Revenue [K\$]	Q3'2019 Revenue [K\$]	Q4'2019 Revenue [K\$]	Q1'2020 Revenue [K\$]	Q2'2020 Revenue [K\$]	Product	Total sum [K\$] for relevant revenue within 2018	Total sum [K\$] for relevant revenue within 2019	Total sum [K\$] for relevant revenue within 2020	Total sum [K\$] for relevant revenue within 29/04/2018 -	Information source category	Covert iOS was provided	Triggere d iOS was provided	Covert Android was provided	Triggere d Android was provided	Covert Android deal portion	maintenan ce related portion	Final calculation of relevant revenue [K\$] 2018	Final calculation of relevant revenue [K\$] 2019	Final calculation of relevant revenue [K\$] 2020	Final calculation of relevant revenue [K\$] 2018-2020	Final relevant profit 2018-2020 [K\$]
7	Acc-01	Maintenance	-	-	-	-	-	78	79	82	81	PGS	0	0	90	90	Contract=GB0	Yes	Yes	No	Yes	0	-	-	-	-	-	
8	Acc-01	New Business	1,376	81	81	81	80	-	-	-	-	PGS	70	124	0	194	Contract=GB0	Yes	Yes	No	Yes	0	-	-	-	-	-	
9	Acc-02	Maintenance	-	-	-	-	-	-	30	395	395	PGS	0	0	434	434	Contract=GB0	Yes	Yes	No	Yes	0	-	-	-	-	-	
10	Acc-02	New Business	-	-	5,651	392	396	400	361	-	-	PGS	0	605	0	605	Contract=GB0	Yes	Yes	No	Yes	0	-	-	-	-	-	
11	Acc-03	Maintenance	-	-	-	-	-	-	-	-	328	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
12	Acc-03	Maintenance	-	-	-	-	-	-	-	-	787	PGS	0	0	346	346	Contract - included GBO - missing details	Yes	Yes	Yes	Yes	0.25	0.45	-	-	39.30	39.30	-
13	Acc-03	Maintenance	-	-	-	-	-	-	-	-	852	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
14	Acc-03	Maintenance	-	-	-	-	384	588	588	582	192	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
15	Acc-03	Maintenance	-	-	-	-	921	1,412	1,412	1,396	460	PGS	0	496	1123	1,619	Contract - included GBO - missing details	Yes	Yes	Yes	Yes	0.25	0.45	-	56.33	127.60	183.93	0.51
16	Acc-03	Maintenance	-	-	-	-	997	1,529	1,529	1,513	499	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
17	Acc-03	Maintenance	208	-	-	-	-	-	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
18	Acc-03	Maintenance	385	590	590	577	192	-	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
19	Acc-03	Maintenance	500	-	-	-	-	-	-	-	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
20	Acc-03	Maintenance	542	-	-	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
21	Acc-03	Maintenance	934	1,400	1,400	1,400	466	-	-	-	-	PGS	1202	1651	0	2,853	Contract - included GBO - missing details	Yes	Yes	Yes	Yes	0.25	0.45	136.61	187.60	-	324.22	1.69
22	Acc-03	Maintenance	1,000	1,533	1,533	1,500	500	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
23	Acc-03	Upsell	-	-	-	-	-	6,139	361	-	-	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
24	Acc-04	Maintenance	-	-	-	-	-	-	-	271	274	LDM - Vole	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
25	Acc-04	Maintenance	-	-	-	-	-	-	-	2,712	2,742	PGS	0	0	2994	2,994	Contract - included GBO - included & elaborated	(blank)	(blank)	Yes	(blank)	0.14	0.45	-	-	190.52	190.52	-
26	Acc-04	Maintenance	-	-	-	-	-	92	290	-	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
27	Acc-04	Maintenance	-	-	-	-	-	105	332	-	-	LDM - Vole	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
28	Acc-04	Maintenance	-	-	-	3,016	3,084	3,117	3,117	-	-	PGS	0	4676	0	4,676	Contract - included GBO - included & elaborated	(blank)	(blank)	Yes	(blank)	0.12	0.45	-	255.06	-	255.06	2.30
29	Acc-04	Maintenance	3,750	3,750	3,750	-	-	-	-	-	-	PGS	3220	0	0	3,220	Contract=GB0	(blank)	(blank)	No	(blank)	0	-	-	-	-	-	
30	Acc-04	Recurring License	-	-	-	-	-	-	-	-	285	HERMES	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
31	Acc-04	Recurring License	-	-	-	-	-	-	-	2,637	418	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
32	Acc-04	Recurring License	-	-	-	3,272	521	527	527	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
33	Acc-04	Recurring License	1,625	1,625	1,625	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1				Total relevant revenue \$	Company Yearly Profit	Total relevant profit \$																						
2			2018	\$ 3,900,371.07	0%	\$ -																						
3			2019	\$ 7,161,342.17	0.9%	\$ 64,452.08																						
4			2020	\$ 4,181,758.15	0%	\$ -																						
5																												
6	Account No.	Deal Type	Q2'2018 Revenue [K\$]	Q3'2018 Revenue [K\$]	Q4'2018 Revenue [K\$]	Q1'2019 Revenue [K\$]	Q2'2019 Revenue [K\$]	Q3'2019 Revenue [K\$]	Q4'2019 Revenue [K\$]	Q1'2020 Revenue [K\$]	Q2'2020 Revenue [K\$]	Product	Total sum [K\$] for relevant revenue within 2018	Total sum [K\$] for relevant revenue within 2019	Total sum [K\$] for relevant revenue within 2020	Total sum [K\$] for relevant revenue within 29/04/2018 -	Information source category	Covert iOS was provided	Triggere d iOS was provided	Covert Android was provided	Triggere d Android was provided	Covert Android deal portion	maintenan ce related	Final calculation of relevant revenue [K\$] 2018	Final calculation of relevant revenue [K\$] 2019	Final calculation of relevant revenue [K\$] 2020	Final calculation of relevant revenue [K\$] 2018-2020	Final relevant profit 2018-2020 [K\$]
34	Acc-04	Upsell	-	-	-	-	-	-	-	1,004	1,015	PGS	0	0	1108	1,108	Contract=GBO	Yes	Yes	No	Yes	0	-	-	-	-	-	-
35	Acc-04	Upsell	-	-	-	-	5,070	-	337	357	357	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
36	Acc-04	Upsell	-	-	6,910	436	441	213	-	-	-	LDM - Vole	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
37	Acc-04	Upsell	-	5,680	389	381	385	165	-	-	-	PGS	334	588	0	922	Contract - included GBO - included & elaborated	(blank)	(blank)	Yes	(blank)	1	1.00	334.23	588.08	-	922.31	5.29
38	Acc-05	Recurring License	-	-	-	-	-	-	-	293	129	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
39	Acc-05	Recurring License	-	-	-	-	-	-	-	880	386	PGS	0	0	750	750	Contract - included GBO - included & elaborated	(blank)	(blank)	Yes	Yes	0.5	1.00	-	-	375.13	375.13	-
40	Acc-05	Recurring License	-	-	-	136	64	-	-	-	-	PGS	0	170	0	170	Contract - included GBO - included & elaborated	(blank)	(blank)	Yes	Yes	0.5	1.00	-	85.17	-	85.17	0.77
41	Acc-05	Recurring License	-	-	-	142	29	29	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
42	Acc-05	Recurring License	-	-	-	204	96	-	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
43	Acc-05	Recurring License	-	-	-	1,231	308	262	-	-	-	PGS	0	1396	0	1,396	Contract - included GBO - included & elaborated	(blank)	(blank)	Yes	Yes	0.28	1.00	-	390.94	-	390.94	3.52
44	Acc-06	Maintenance	-	-	-	-	-	-	-	-	94	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
45	Acc-06	Maintenance	-	-	-	-	-	-	-	-	155	PGS	0	0	68	68	Contract=GBO	Yes	No	No	No	0	-	-	-	-	-	-
46	Acc-06	Maintenance	-	-	-	-	-	-	-	31	31	PGS	0	0	34	34	Contract=GBO	Yes	Yes	Yes	Yes	0.25	0.45	-	-	3.87	3.87	-
47	Acc-06	Maintenance	-	-	-	-	-	-	-	82	83	PGS	0	0	90	90	Contract=GBO	No	Yes	No	No	0	-	-	-	-	-	-
48	Acc-06	Maintenance	-	-	-	-	96	97	98	95	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
49	Acc-06	Maintenance	-	-	-	-	158	160	161	157	-	PGS	0	85	103	188	Contract=GBO	Yes	No	No	No	0	-	-	-	-	-	-
50	Acc-06	New Business	91	92	92	97	-	-	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
51	Acc-06	New Business	150	151	151	159	-	-	-	-	-	PGS	130	159	0	289	Contract=GBO	No	Yes	No	Yes	0	-	-	-	-	-	-
52	Acc-06	Upsell	-	-	-	314	23	24	24	22	22	PIX - Carkit	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
53	Acc-06	Upsell	-	-	-	633	47	47	47	45	45	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
54	Acc-06	Upsell	-	-	-	1,154	86	86	86	83	83	PGS	0	1200	91	1,291	Contract - included GBO - included & elaborated	No	No	Yes	No	1	1.00	-	1,199.92	90.74	1,290.66	10.80
55	Acc-06	Upsell	-	-	-	1,248	93	94	94	89	89	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
56	Acc-06	Upsell	-	-	82	6	6	-	-	6	6	PGS	70	9	6	86	Contract=GBO	No	No	No	No	0	-	-	-	-	-	-
57	Acc-06	Upsell	-	102	34	32	34	36	36	-	-	PGS	29	50	0	79	Contract=GBO	(blank)	(blank)	No	(blank)	0	-	-	-	-	-	-
58	Acc-06	Upsell	-	269	91	84	90	96	96	-	-	PGS	78	132	0	211	Contract=GBO	Yes	Yes	No	No	0	-	-	-	-	-	-
59	Acc-06	Upsell	323	37	25	23	24	24	24	22	11	PIX - Carkit	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1				Total relevant revenue \$	Company Yearly Profit	Total relevant profit \$																						
2			2018	\$ 3,900,371.07	0%	\$ -																						
3			2019	\$ 7,161,342.17	0.9%	\$ 64,452.08																						
4			2020	\$ 4,181,758.15	0%	\$ -																						
5																												
6	Account No.	Deal Type	Q2'2018 Revenue [K\$]	Q3'2018 Revenue [K\$]	Q4'2018 Revenue [K\$]	Q1'2019 Revenue [K\$]	Q2'2019 Revenue [K\$]	Q3'2019 Revenue [K\$]	Q4'2019 Revenue [K\$]	Q1'2020 Revenue [K\$]	Q2'2020 Revenue [K\$]	Product	Total sum [K\$] for relevant revenue within 2018	Total sum [K\$] for relevant revenue within 2019	Total sum [K\$] for relevant revenue within 2020	Total sum [K\$] for relevant revenue within 29/04/2018 -	Information source category	Covert iOS was provided	Triggere d iOS was provided	Covert Android was provided	Triggere d Android was provided	Covert Android deal portion	maintenan ce related	Final calculation of relevant revenue [K\$] 2018	Final calculation of relevant revenue [K\$] 2019	Final calculation of relevant revenue [K\$] 2020	Final calculation of relevant revenue [K\$] 2018-2020	Final relevant profit 2018-2020 [K\$]
60	Acc-07	New Business	-	-	-	-	-	-	-	-	5,124	PGS	0	0	0	-	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.1575	-	-	-	-	-	-
61	Acc-08	Maintenance	35	18	18	17	17	18	18	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
62	Acc-08	Maintenance	127	128	128	126	127	128	128	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
63	Acc-08	New Business	-	-	-	-	1,716	-	65	121	121	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
64	Acc-08	New Business	-	624	29	28	29	29	29	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
65	Acc-08	Upsell	-	-	-	-	1,528	107	109	107	107	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
66	Acc-09	Maintenance	-	(1)	-	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
67	Acc-09	Maintenance	-	112	-	-	-	-	-	-	112	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
68	Acc-10	Maintenance	-	-	-	-	-	564	1,103	1,092	1,092	PGS	0	0	1199	1,199	Contract=GBO	Yes	Yes	Yes	Yes	0.25	0.45	-	-	136.30	136.30	-
69	Acc-10	Maintenance	-	720	1,103	1,080	1,092	384	-	-	-	PGS	948	1667	0	2,615	Contract=GBO	Yes	Yes	Yes	Yes	0.25	0.45	107.68	189.46	-	297.14	1.71
70	Acc-10	New Business	1,092	372	-	-	-	-	-	-	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
71	Acc-12	New Business	44	44	23	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
72	Acc-13	Maintenance	-	-	-	-	-	-	-	71	72	PGS	0	0	78	78	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	-	-	8.91	8.91	-
73	Acc-13	Maintenance	-	-	-	69	69	69	70	-	-	PGS	0	107	0	107	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	-	12.12	-	12.12	0.11
74	Acc-13	Maintenance	74	73	73	-	-	-	-	-	-	PGS	63	0	0	63	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	7.12	-	-	7.12	-
75	Acc-14	Maintenance	-	-	-	-	-	-	-	24	75	PGS	0	0	49	49	Contract - included GBO - missing details	Yes	Yes	Yes	Yes	0.25	0.45	-	-	5.54	5.54	-
76	Acc-14	Maintenance	-	-	-	25	73	72	73	50	-	PGS	0	64	33	97	Contract - included GBO - missing details	Yes	Yes	Yes	Yes	0.25	0.45	-	7.26	3.75	11.01	0.07
77	Acc-14	Maintenance	75	75	75	50	-	-	-	-	-	PGS	65	50	0	115	Contract=GBO	Yes	Yes	No	No	0	-	-	-	-	-	-
78	Acc-16	Maintenance	-	-	-	-	-	-	-	6	53	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
79	Acc-16	Maintenance	-	-	-	-	-	-	-	25	232	PGS	0	0	119	119	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.093	0.45	-	-	5.02	5.02	-
80	Acc-16	New Business	-	-	-	787	58	55	56	46	-	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
81	Acc-16	New Business	-	-	-	3,450	253	242	243	204	-	PGS	0	3586	134	3,720	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.093	1.00	-	333.48	12.49	345.98	3.00
82	Acc-16	Upsell	-	-	-	-	-	-	-	-	131	PGS	0	0	58	58	Contract=GBO	No	No	No	No	0	-	-	-	-	-	-
83	Acc-16	Upsell	-	-	-	-	-	-	-	-	963	PGS	0	0	423	423	Contract=GBO	No	No	No	No	0	-	-	-	-	-	-
84	Acc-16	Upsell	-	-	-	-	-	-	-	-	1,576	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1				Total relevant revenue \$	Company Yearly Profit	Total relevant profit \$																						
2			2018	\$ 3,900,371.07	0%	\$ -																						
3			2019	\$ 7,161,342.17	0.9%	\$ 64,452.08																						
4			2020	\$ 4,181,758.15	0%	\$ -																						
5																												
6	Account No.	Deal Type	Q2'2018 Revenue [K\$]	Q3'2018 Revenue [K\$]	Q4'2018 Revenue [K\$]	Q1'2019 Revenue [K\$]	Q2'2019 Revenue [K\$]	Q3'2019 Revenue [K\$]	Q4'2019 Revenue [K\$]	Q1'2020 Revenue [K\$]	Q2'2020 Revenue [K\$]	Product	Total sum [K\$] for relevant revenue within 2018	Total sum [K\$] for relevant revenue within 2019	Total sum [K\$] for relevant revenue within 2020	Total sum [K\$] for relevant revenue within 29/04/2018 -	Information source category	Covert iOS was provided	Triggere d iOS was provided	Covert Android was provided	Triggere d Android was provided	Covert Android deal portion	maintenan ce related	Final calculation of relevant revenue [K\$] 2018	Final calculation of relevant revenue [K\$] 2019	Final calculation of relevant revenue [K\$] 2020	Final calculation of relevant revenue [K\$] 2018-2020	Final relevant profit 2018-2020 [K\$]
85	Acc-16	Upsell	-	-	-	-	-	-	217	18	15	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
86	Acc-16	Upsell	-	-	-	-	-	-	1,216	99	81	PGS	0	0	101	101	Contract=GB0	Yes	Yes	Yes	Yes	0.25	1.00	-	-	25.22	25.22	-
	Acc-18																Contract - not definitive GBO - not included Escalated to full											
87	New Business	-	-	-	3,120	217	222	222	219	-	PGS	0	3237	145	3,381	portfolio	Yes	Yes	Yes	Yes	0.25	1.00	-	809.21	36.16	845.37	7.28	
88	Acc-19	New Business	-	-	-	-	-	-	4,594	319	PGS	0	0	4734	4,734	Contract=GB0	No	Yes	No	Yes	0	-	-	-	-	-	-	
89	Acc-20	Maintenance	58	59	59	58	58	59	59	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
90	Acc-21	Maintenance	-	-	-	-	-	-	-	-	45	PGS	0	0	20	20	Contract=GB0	Yes	Yes	No	Yes	0	-	-	-	-	-	
91	Acc-21	Maintenance	-	-	-	-	-	-	86	262	262	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
	Acc-21																Contract - not definitive GBO - not included Escalated to full											
92	Maintenance	-	-	-	-	-	-	-	432	1,309	1,309	PGS	0	0	1438	1,438	portfolio	Yes	Yes	Yes	Yes	0.25	0.52	-	-	188.36	188.36	-
93	Acc-21	Maintenance	-	-	-	246	251	254	168	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
	Acc-21																Contract - not definitive GBO - not included Escalated to full											
94	Maintenance	-	-	-	1,228	1,255	1,269	841	-	-	PGS	0	1904	0	1,904	portfolio	Yes	Yes	Yes	Yes	0.25	0.52	-	249.30	-	249.30	2.24	
95	Acc-21	Maintenance	262	265	265	-	-	-	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
	Acc-21																Contract - not definitive GBO - not included Escalated to full											
96	Maintenance	1,311	1,326	1,326	-	-	-	-	-	-	PGS	1138	0	0	1,138	portfolio	Yes	Yes	Yes	Yes	0.25	0.52	149.08	-	-	149.08	-	
97	Acc-21	Upsell	-	-	-	-	5,180	344	344	340	292	PGS	0	0	353	353	Contract=GB0	Yes	Yes	No	Yes	0	-	-	-	-	-	
98	Acc-22	Recurring License	51	51	51	17	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
99	Acc-22	Recurring License	59	58	58	19	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
100	Acc-23	New Business	-	-	-	-	-	-	1,571	45	75	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
	Acc-23																Contract - included GBO - included & elaborated											
101	New Business	-	-	-	-	-	-	-	6,283	287	473	PGS	0	0	397	397		Yes	Yes	Yes	Yes	0.25	1.00	-	-	99.27	99.27	-
102	Acc-24	Maintenance	53	169	169	108	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
103	Acc-24	Maintenance	101	-	-	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
104	Acc-25	Recurring License	-	-	-	-	-	-	-	-	287	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
105	Acc-26	Maintenance	-	-	-	-	-	-	19	153	153	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
106	Acc-26	Maintenance	-	-	-	-	-	-	19	153	153	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
	Acc-26																Contract - included GBO - included & elaborated											
107	Maintenance	-	-	-	-	-	-	-	45	372	372	PGS	0	0	409	409		Yes	Yes	Yes	Yes	0.1	0.47	-	-	19.38	19.38	-

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1				Total relevant revenue \$	Company Yearly Profit	Total relevant profit \$																						
2			2018	\$ 3,900,371.07	0%	\$ -																						
3			2019	\$ 7,161,342.17	0.9%	\$ 64,452.08																						
4			2020	\$ 4,181,758.15	0%	\$ -																						
5																												
6	Account No.	Deal Type	Q2'2018 Revenue [K\$]	Q3'2018 Revenue [K\$]	Q4'2018 Revenue [K\$]	Q1'2019 Revenue [K\$]	Q2'2019 Revenue [K\$]	Q3'2019 Revenue [K\$]	Q4'2019 Revenue [K\$]	Q1'2020 Revenue [K\$]	Q2'2020 Revenue [K\$]	Product	Total sum [K\$] for relevant revenue within 2018	Total sum [K\$] for relevant revenue within 2019	Total sum [K\$] for relevant revenue within 2020	Total sum [K\$] for relevant revenue within 29/04/2018 -	Information source category	Covert iOS was provided	Triggere d iOS was provided	Covert Android was provided	Triggere d Android was provided	Covert Android deal portion	maintenan ce related	Final calculation of relevant revenue [K\$] 2018	Final calculation of relevant revenue [K\$] 2019	Final calculation of relevant revenue [K\$] 2020	Final calculation of relevant revenue [K\$] 2018-2020	Final relevant profit 2018-2020 [K\$]
108	Acc-26	New Business	-	-	-	-	-	-	2,727	157	157	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
109	Acc-26	New Business	-	-	899	60	60	60	25	-	-	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
110	Acc-26	New Business	-	-	3,447	270	267	268	442	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
111	Acc-26	New Business	-	-	7,797	520	513	515	294	-	-	PGS	0	797	0	797	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.1	1.00	0.00	79.68	-	79.68	0.72
112	Acc-27	Maintenance	-	-	-	-	-	-	-	-	188	PGS	0	0	83	83	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.141	0.45	-	-	5.30	5.30	-
113	Acc-27	New Business	-	-	-	-	5,723	393	393	375	183	PGS	0	5723	327	6,051	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.141	1.00	-	806.95	46.17	853.13	7.26
114	Acc-29	New Business	-	-	-	-	-	-	9,078	605	604	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
115	Acc-29	New Business	-	-	-	-	-	-	12,255	816	816	PGS	0	0	897	897	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.13	1.00	-	-	116.58	116.58	-
116	Acc-31	Maintenance	-	-	-	-	-	-	-	25	327	PGS	0	0	160	160	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.16	0.45	-	-	11.66	11.66	-
117	Acc-31	Maintenance	-	-	-	-	-	-	-	27	22	PGS	0	0	27	27	Contract=GBO	Yes	Yes	No	Yes	0	-	-	-	-	-	-
118	Acc-31	Maintenance	-	-	-	24	348	329	329	278	-	PGS	0	212	183	395	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.16	0.45	-	15.39	13.33	28.72	0.14
119	Acc-31	New Business	350	354	354	223	-	-	-	-	-	PGS	304	223	0	527	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.16	1.00	48.60	35.73	-	84.32	0.32
120	Acc-31	Upsell	-	-	-	-	-	-	-	-	120	PGS	0	0	53	53	Contract=GBO	No	No	No	No	0	-	-	-	-	-	-
121	Acc-31	Upsell	-	-	-	333	25	23	33	-	-	PGS	0	346	0	346	Contract=GBO	Yes	Yes	No	Yes	0	-	-	-	-	-	-
122	Acc-32	New Business	-	-	-	-	-	5,884	404	393	393	PGS	0	0	432	432	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.23	1.00	-	-	99.31	99.31	-
123	Acc-32	Upsell	-	-	-	-	-	-	-	-	78	PGS	0	0	34	34	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.25	1.00	-	-	8.55	8.55	-
124	Acc-32	Upsell	-	-	-	-	-	-	-	-	78	PGS	0	0	34	34	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.25	1.00	-	-	8.61	8.61	-
125	Acc-32	Upsell	-	-	-	-	-	-	-	-	157	PGS	0	0	69	69	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.25	1.00	-	-	17.23	17.23	-
126	Acc-32	Upsell	-	-	-	-	-	-	-	75	-	PGS	0	0	49	49	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.25	1.00	-	-	12.35	12.35	-
127	Acc-32	Upsell	-	-	-	-	-	-	-	76	-	PGS	0	0	50	50	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.25	1.00	-	-	12.55	12.55	-
128	Acc-32	Upsell	-	-	-	-	-	-	-	2,874	199	SPIDER	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
129	Acc-32	Upsell	-	-	-	-	-	-	-	78	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
130	Acc-32	Upsell	-	-	-	-	-	-	-	78	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
131	Acc-32	Upsell	-	-	-	-	-	-	-	153	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1				Total relevant revenue \$	Company Yearly Profit	Total relevant profit \$																						
2			2018	\$ 3,900,371.07	0%	\$ -																						
3			2019	\$ 7,161,342.17	0.9%	\$ 64,452.08																						
4			2020	\$ 4,181,758.15	0%	\$ -																						
5																												
6	Account No.	Deal Type	Q2'2018 Revenue [K\$]	Q3'2018 Revenue [K\$]	Q4'2018 Revenue [K\$]	Q1'2019 Revenue [K\$]	Q2'2019 Revenue [K\$]	Q3'2019 Revenue [K\$]	Q4'2019 Revenue [K\$]	Q1'2020 Revenue [K\$]	Q2'2020 Revenue [K\$]	Product	Total sum [K\$] for relevant revenue within 2018	Total sum [K\$] for relevant revenue within 2019	Total sum [K\$] for relevant revenue within 2020	Total sum [K\$] for relevant revenue within 29/04/2018 -	Information source category	Covert iOS was provided	Triggere d iOS was provided	Covert Android was provided	Triggere d Android was provided	Covert Android deal portion	maintenan ce related	Final calculation of relevant revenue [K\$] 2018	Final calculation of relevant revenue [K\$] 2019	Final calculation of relevant revenue [K\$] 2020	Final calculation of relevant revenue [K\$] 2018-2020	Final relevant profit 2018-2020 [K\$]
132	Acc-32	Upsell	-	-	-	-	-	-	231	-	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
133	Acc-33	Maintenance	-	-	-	-	-	-	-	58	58	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
134	Acc-33	Maintenance	-	-	-	-	-	-	-	284	287	PGS	0	0	313	313	Contract=GBO	No	Yes	No	Yes	0	-	-	-	-	-	-
135	Acc-33	Maintenance	-	-	-	-	-	31	43	41	41	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
136	Acc-33	Maintenance	-	-	-	-	-	64	87	86	86	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
137	Acc-33	Maintenance	-	-	-	30	30	30	30	-	-	PGS	0	46	0	46	Contract=GBO	No	Yes	No	Yes	0	-	-	-	-	-	
138	Acc-33	Maintenance	-	-	-	30	30	30	30	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
139	Acc-33	Maintenance	-	-	-	298	297	297	296	-	-	PGS	0	458	0	458	Contract=GBO	No	Yes	No	Yes	0	-	-	-	-	-	
140	Acc-33	Maintenance	-	34	46	42	42	11	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
141	Acc-33	Maintenance	-	71	95	96	98	25	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
142	Acc-33	Maintenance	42	11	-	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
143	Acc-33	Maintenance	88	22	-	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
144	Acc-33	Maintenance	313	313	313	-	-	-	-	-	-	PGS	268	0	0	268	Contract=GBO	No	Yes	No	Yes	0	-	-	-	-	-	
145	Acc-33	Recurring License	-	-	-	-	-	-	-	745	118	PGS	0	0	543	543	Contract - included GBO - included & elaborated	Yes	No	Yes	No	0.5	1.00	-	-	271.70	271.70	-
146	Acc-33	Recurring License	-	-	-	-	-	-	-	745	118	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
147	Acc-33	Recurring License	-	-	-	264	299	285	286	-	-	PGS	0	425	0	425	Contract - included GBO - included & elaborated	Yes	No	Yes	No	0.5	1.00	-	212.74	-	212.74	1.91
148	Acc-33	Recurring License	-	-	-	278	281	281	280	-	-	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
149	Acc-33	Recurring License	-	712	676	-	-	-	-	-	-	PGS	580	0	0	580	Contract - included GBO - included & elaborated	Yes	No	Yes	No	0.5	1.00	290.08	-	-	290.08	-
150	Acc-33	Upsell	31	32	31	-	-	-	-	-	-	PGS	27	0	0	27	Contract=GBO	Yes	Yes	No	No	0	-	-	-	-	-	
151	Acc-33	Upsell	31	32	31	-	-	-	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
152	Acc-34	Maintenance	-	-	-	-	-	-	-	285	100	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
153	Acc-34	New Business	-	-	-	-	558	400	150	65	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
154	Acc-34	New Business	281	284	284	86	-	-	-	-	-	PGS	244	86	0	330	Contract - not definitive GBO - not included Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	1.00	60.88	21.58	-	82.45	0.19
155	Acc-37	New Business	-	692	57	67	68	68	68	68	68	Momento	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
156	Acc-37	New Business	-	2,220	184	215	217	220	220	217	217	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
157	Acc-38	New Business	-	692	57	67	68	68	68	68	68	Momento	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1				Total relevant revenue \$	Company Yearly Profit	Total relevant profit \$																						
2			2018	\$ 3,900,371.07	0%	\$ -																						
3			2019	\$ 7,161,342.17	0.9%	\$ 64,452.08																						
4			2020	\$ 4,181,758.15	0%	\$ -																						
5																												
6	Account No.	Deal Type	Q2'2018 Revenue [K\$]	Q3'2018 Revenue [K\$]	Q4'2018 Revenue [K\$]	Q1'2019 Revenue [K\$]	Q2'2019 Revenue [K\$]	Q3'2019 Revenue [K\$]	Q4'2019 Revenue [K\$]	Q1'2020 Revenue [K\$]	Q2'2020 Revenue [K\$]	Product	Total sum [K\$] for relevant revenue within 2018	Total sum [K\$] for relevant revenue within 2019	Total sum [K\$] for relevant revenue within 2020	Total sum [K\$] for relevant revenue within 29/04/2018 -	Information source category	Covert iOS was provided	Triggere d iOS was provided	Covert Android was provided	Triggere d Android was provided	Covert Android deal portion	maintenan ce related	Final calculation of relevant revenue [K\$] 2018	Final calculation of relevant revenue [K\$] 2019	Final calculation of relevant revenue [K\$] 2020	Final calculation of relevant revenue [K\$] 2018-2020	Final relevant profit 2018-2020 [K\$]
158	Acc-38	New Business	-	2,220	184	215	217	220	220	217	217	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
159	Acc-39	Maintenance	-	-	-	-	-	-	-	42	158	PGS	0	0	97	97	Contract - included GBO - included & elaborated	No	No	Yes	Yes	0.072	0.45	-	-	3.18	3.18	-
160	Acc-39	New Business	-	-	-	5,502	384	388	388	338	-	PGS	0	5709	223	5,931	Contract - included GBO - included & elaborated	No	No	Yes	Yes	0.072	1.00	-	411.04	16.02	427.07	3.70
161	Acc-40	Maintenance	-	-	-	-	-	-	-	-	352	PGS	0	0	155	155	Contract - not definitive GBO - not included Escalated to full portfolio	No	No	Yes	Yes	0.5	0.55	-	-	42.24	42.24	-
162	Acc-40	Maintenance	-	-	-	-	-	720	-	-	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
163	Acc-40	Maintenance	-	-	-	-	720	-	-	-	-	PGS	0	388	0	388	Contract - not definitive GBO - not included Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.55	-	52.90	-	52.90	0.48
164	Acc-40	Maintenance	-	1,011	759	-	-	-	-	-	-	PGS	651	0	0	651	Contract - not definitive GBO - not included Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.55	88.82	-	-	88.82	-
165	Acc-40	New Business	479	-	-	-	-	-	-	-	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
166	Acc-40	Recurring License	-	-	-	-	-	-	-	-	707	PGS	0	0	311	311	Contract - not definitive GBO - not included Escalated to full portfolio	No	Yes	No	Yes	0	-	-	-	-	-	-
167	Acc-41	New Business	-	-	-	-	-	-	5,863	-	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
168	Acc-43	Maintenance	-	-	-	-	-	-	-	3	4	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
169	Acc-43	Maintenance	-	-	-	-	-	-	-	50	70	PGS	0	0	64	64	Contract=GBO	Yes	Yes	No	Yes	0	-	-	-	-	-	-
170	Acc-43	New Business	-	-	-	86	4	3	5	1	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
171	Acc-43	New Business	-	-	-	1,428	71	72	71	23	-	PGS	0	1466	15	1,482	Contract=GBO	Yes	Yes	No	Yes	0	-	-	-	-	-	-
172	Acc-43	Upsell	-	-	-	-	-	-	-	128	8	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
173	Acc-43	Upsell	-	-	-	-	-	-	2,040	128	128	PGS	0	0	140	140	Contract=GBO	Yes	Yes	No	Yes	0	-	-	-	-	-	-
174	Acc-44	Maintenance	-	-	-	-	-	-	-	370	374	PGS	0	0	408	408	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	-	-	46.39	46.39	-
175	Acc-44	Maintenance	-	-	-	-	64	384	386	-	-	PGS	0	34	0	34	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	-	3.92	-	3.92	0.04
176	Acc-44	Maintenance	-	-	-	321	321	-	-	-	-	PGS	0	494	0	494	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	-	56.09	-	56.09	0.50

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1				Total relevant revenue \$	Company Yearly Profit	Total relevant profit \$																						
2			2018	\$ 3,900,371.07	0%	\$ -																						
3			2019	\$ 7,161,342.17	0.9%	\$ 64,452.08																						
4			2020	\$ 4,181,758.15	0%	\$ -																						
5																												
6	Account No.	Deal Type	Q2'2018 Revenue [K\$]	Q3'2018 Revenue [K\$]	Q4'2018 Revenue [K\$]	Q1'2019 Revenue [K\$]	Q2'2019 Revenue [K\$]	Q3'2019 Revenue [K\$]	Q4'2019 Revenue [K\$]	Q1'2020 Revenue [K\$]	Q2'2020 Revenue [K\$]	Product	Total sum [K\$] for relevant revenue within 2018	Total sum [K\$] for relevant revenue within 2019	Total sum [K\$] for relevant revenue within 2020	Total sum [K\$] for relevant revenue within 29/04/2018 -	Information source category	Covert iOS was provided	Triggere d iOS was provided	Covert Android was provided	Triggere d Android was provided	Covert Android deal portion	maintenan ce related portion	Final calculation of relevant revenue [K\$] 2018	Final calculation of relevant revenue [K\$] 2019	Final calculation of relevant revenue [K\$] 2020	Final calculation of relevant revenue [K\$] 2018-2020	Final relevant profit 2018-2020 [K\$]
177	Acc-44	Maintenance	-	-	385	-	-	-	-	-	-	PGS	331	0	0	331	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	37.57	-	-	37.57	-
178	Acc-44	New Business	181	-	-	-	-	-	-	-	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
179	Acc-45	Maintenance	-	-	-	-	-	-	-	25	151	PGS	0	0	83	83	Contract=GBO	No	Yes	No	Yes	0	-	-	-	-	-	
180	Acc-45	Maintenance	-	-	-	-	-	-	-	85	85	PGS	0	0	93	93	Contract - included GBO - included & elaborated	No	Yes	Yes	Yes	0.5	0.45	-	-	21.19	21.19	-
181	Acc-45	Maintenance	-	-	-	-	-	42	63	60	60	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
182	Acc-45	Maintenance	-	-	-	26	170	156	156	125	-	PGS	0	117	82	199	Contract=GBO	No	Yes	No	Yes	0	-	-	-	-	-	
183	Acc-45	New Business	-	990	63	63	63	21	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
184	Acc-45	New Business	162	164	164	128	-	-	-	-	-	PGS	141	128	0	268	Contract=GBO	No	Yes	No	Yes	0	-	-	-	-	-	
185	Acc-45	Upsell	-	-	1,585	109	121	112	97	-	-	PGS	0	174	0	174	Contract - included GBO - included & elaborated	No	Yes	Yes	Yes	0.5	1.00	-	87.14	-	87.14	0.78
186	Acc-46	Maintenance	-	-	-	-	-	-	14	51	51	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
187	Acc-46	Maintenance	-	-	-	-	-	-	56	202	202	PGS	0	0	222	222	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.2439	0.45	-	-	24.63	24.63	-
188	Acc-46	New Business	-	-	811	52	56	57	40	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
189	Acc-46	New Business	-	-	3,244	209	224	226	164	-	-	PGS	3234	329	0	3,563	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.2439	1.00	788.69	80.31	-	869.00	0.72
190	Acc-46	Upsell	-	-	-	-	-	-	63	4	4	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	
191	Acc-46	Upsell	-	-	-	-	-	-	252	17	17	PGS	0	0	18	18	Contract=GBO	No	No	No	No	0	-	-	-	-	-	
192	Acc-47	Maintenance	346	173	-	-	(64)	-	-	-	-	PGS	0	-34	0	(34)	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	-	(3.89)	-	(3.89)	(0.04)
193	Acc-48	Maintenance	-	-	-	-	-	-	-	247	750	PGS	0	0	493	493	BEC decision	Yes	No	Yes	No	0.5	0.45	-	-	111.98	111.98	-
194	Acc-48	Maintenance	-	-	-	0	1,000	750	756	494	-	PGS	0	538	326	864	BEC decision	Yes	No	Yes	No	0.5	0.45	-	122.38	74.00	196.38	1.10
195	Acc-48	Maintenance	1,531	765	-	-	(282)	-	-	-	-	PGS	0	-152	0	(152)	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	-	(17.23)	-	(17.23)	(0.16)
196	Acc-49	Maintenance	915	458	-	-	(168)	-	-	-	-	PGS	0	-91	0	(91)	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	-	(10.30)	-	(10.30)	(0.09)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1				Total relevant revenue \$	Company Yearly Profit	Total relevant profit \$																						
2			2018	\$ 3,900,371.07	0%	\$ -																						
3			2019	\$ 7,161,342.17	0.9%	\$ 64,452.08																						
4			2020	\$ 4,181,758.15	0%	\$ -																						
5																												
6	Account No.	Deal Type	Q2'2018 Revenue [K\$]	Q3'2018 Revenue [K\$]	Q4'2018 Revenue [K\$]	Q1'2019 Revenue [K\$]	Q2'2019 Revenue [K\$]	Q3'2019 Revenue [K\$]	Q4'2019 Revenue [K\$]	Q1'2020 Revenue [K\$]	Q2'2020 Revenue [K\$]	Product	Total sum [K\$] for relevant revenue within 2018	Total sum [K\$] for relevant revenue within 2019	Total sum [K\$] for relevant revenue within 2020	Total sum [K\$] for relevant revenue within 29/04/2018 -	Information source category	Covert iOS was provided	Triggere d iOS was provided	Covert Android was provided	Triggere d Android was provided	Covert Android deal portion	maintenan ce related portion	Final calculation of relevant revenue [K\$] 2018	Final calculation of relevant revenue [K\$] 2019	Final calculation of relevant revenue [K\$] 2020	Final calculation of relevant revenue [K\$] 2018-2020	Final relevant profit 2018-2020 [K\$]
197	Acc-49	New Business	-	6,318	323	441	446	450	122	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
198	Acc-50	New Business	-	-	-	-	-	-	-	554	39	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
199	Acc-51	Maintenance	-	-	21	10	10	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
200	Acc-51	Maintenance	10	-	-	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
201	Acc-53	Maintenance	23	126	126	124	(150)	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
202	Acc-54	New Business	65	-	-	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
203	Acc-55	Maintenance	44	15	-	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
204	Acc-56	New Business	-	-	-	-	-	-	4,509	208	431	PGS	0	0	326	326	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.25	1.00	-	-	81.60	81.60	-
205	Acc-57	Maintenance	-	-	-	-	-	15	75	74	74	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
206	Acc-57	Maintenance	-	-	-	-	-	52	250	247	247	PGS	0	0	271	271	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.154	0.45	-	-	18.99	18.99	-
207	Acc-57	Maintenance	-	-	-	-	-	61	294	291	291	PGS	0	0	320	320	Contract - included GBO - included & elaborated	(blank)	(blank)	Yes	(blank)	0.16949	0.45	-	-	24.66	24.66	-
208	Acc-57	Maintenance	-	16	75	73	74	59	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
209	Acc-57	Maintenance	-	52	250	245	248	196	-	-	-	PGS	215	378	0	593	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.154	0.45	15.04	26.46	-	41.50	0.24
210	Acc-57	New Business	74	59	-	-	-	-	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
211	Acc-57	New Business	248	196	-	-	-	-	-	-	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
212	Acc-57	Upsell	-	4,754	295	289	292	270	-	-	-	PGS	254	446	0	700	Contract - included GBO - included & elaborated	(blank)	(blank)	Yes	(blank)	0.16949	1.00	42.97	75.61	-	118.58	0.68
213	Acc-61	Maintenance	-	-	-	-	-	-	486	486	486	PGS	0	0	534	534	Contract=GBO	Yes	Yes	No	Yes	(blank)	-	-	-	-	-	-
214	Acc-61	Upsell	-	11,296	493	482	488	241	-	-	-	PGS	423	745	0	1,168	Contract=GBO	Yes	Yes	No	Yes	(blank)	-	-	-	-	-	-
215	Acc-62	New Business	-	1,705	162	148	161	162	162	145	145	PGS	139	235	159	534	Contract=GBO	Yes	Yes	No	Yes	(blank)	-	-	-	-	-	-
216	Acc-63	Maintenance	-	-	-	-	-	-	-	335	338	PGS	0	0	370	370	Contract=GBO	Yes	Yes	No	Yes	0	-	-	-	-	-	-
217	Acc-63	Maintenance	-	-	-	343	352	356	356	-	-	PGS	0	532	0	532	Contract=GBO	Yes	Yes	No	Yes	0	-	-	-	-	-	-
218	Acc-63	New Business	362	366	219	-	-	-	-	-	-	PGS	188	0	0	188	Contract=GBO	Yes	Yes	No	Yes	0	-	-	-	-	-	-
219	Acc-66	Maintenance	-	-	-	-	-	-	-	-	45	PGS	0	0	20	20	Contract=GBO	Yes	Yes	Yes	Yes	0.25	0.50	-	-	2.45	2.45	-
220	Acc-66	Maintenance	-	-	-	-	44	454	454	449	399	PGS	0	24	471	495	Contract=GBO	Yes	Yes	Yes	Yes	0.25	0.50	-	2.99	58.93	61.92	0.03

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1				Total relevant revenue \$	Company Yearly Profit	Total relevant profit \$																						
2			2018	\$ 3,900,371.07	0%	\$ -																						
3			2019	\$ 7,161,342.17	0.9%	\$ 64,452.08																						
4			2020	\$ 4,181,758.15	0%	\$ -																						
5																												
6	Account No.	Deal Type	Q2'2018 Revenue [K\$]	Q3'2018 Revenue [K\$]	Q4'2018 Revenue [K\$]	Q1'2019 Revenue [K\$]	Q2'2019 Revenue [K\$]	Q3'2019 Revenue [K\$]	Q4'2019 Revenue [K\$]	Q1'2020 Revenue [K\$]	Q2'2020 Revenue [K\$]	Product	Total sum [K\$] for relevant revenue within 2018	Total sum [K\$] for relevant revenue within 2019	Total sum [K\$] for relevant revenue within 2020	Total sum [K\$] for relevant revenue within 29/04/2018 -	Information source category	Covert iOS was provided	Triggere d iOS was provided	Covert Android was provided	Triggere d Android was provided	Covert Android deal portion	maintenan ce related	Final calculation of relevant revenue [K\$] 2018	Final calculation of relevant revenue [K\$] 2019	Final calculation of relevant revenue [K\$] 2020	Final calculation of relevant revenue [K\$] 2018-2020	Final relevant profit 2018-2020 [K\$]
221	Acc-66	New Business	450	450	450	451	393	-	-	-	-	PGS	386	662	0	1,048	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	1.00	96.60	165.46	-	262.06	1.49
222	Acc-66	Upsell	-	-	-	-	-	-	-	1,200	0	HERMES	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
223	Acc-66	Upsell	-	-	-	-	-	-	-	1,200	0	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
224	Acc-66	Upsell	-	-	-	-	-	-	-	1,728	-	Maestro	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
225	Acc-66	Upsell	-	-	-	-	-	-	5,618	344	344	PGS	0	0	378	378	Contract=GBO	Yes	Yes	No	Yes	0	-	-	-	-	-	-
226	Acc-66	Upsell	-	-	-	-	-	4,578	282	279	279	PGS	0	0	307	307	Contract=GBO	Yes	Yes	No	Yes	0	-	-	-	-	-	-
227	Acc-67	Maintenance	-	-	-	-	47	117	117	115	67	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
228	Acc-67	Maintenance	-	-	-	-	333	829	829	820	477	PGS	0	179	750	930	Contract=GBO	(blank)	(blank)	No	(blank)	0	-	-	-	-	-	-
229	Acc-67	New Business	1,836	117	117	114	67	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
230	Acc-67	New Business	13,053	829	829	811	478	-	-	-	-	PGS	712	1068	0	1,780	Contract=GBO	(blank)	(blank)	No	(blank)	0	-	-	-	-	-	-
231	Acc-67	Upsell	-	-	-	-	-	2,990	418	188	188	LDM - Vole	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
232	Acc-67	Upsell	-	-	-	-	6,360	332	189	402	401	PGS	0	0	441	441	Contract=GBO	(blank)	(blank)	No	(blank)	0	-	-	-	-	-	-
233	Acc-67	Upsell	-	-	2,635	164	166	167	119	-	-	PIX - Carkit	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
234	Acc-68	Maintenance	-	-	-	-	-	-	-	7	21	PGS	0	0	14	14	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	-	-	1.58	1.58	-
235	Acc-68	Maintenance	-	-	-	7	23	21	21	11	-	PGS	0	19	7	27	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	-	2.19	0.85	3.04	0.02
236	Acc-68	Maintenance	22	22	22	14	-	-	-	-	-	PGS	18	14	0	33	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	2.10	1.63	-	3.73	0.01
237	Acc-68	New Business	7	-	-	-	-	-	-	-	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
238	Acc-69	Recurring License	-	-	-	-	-	-	-	260	4	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
239	Acc-69	Recurring License	-	-	-	-	-	-	-	1,279	201	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
240	Acc-69	Recurring License	-	-	-	9	10	11	11	2	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
241	Acc-69	Recurring License	-	-	-	150	176	174	178	27	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
242	Acc-69	Recurring License	-	-	-	246	298	301	301	46	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
243	Acc-69	Recurring License	10	11	11	2	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
244	Acc-69	Recurring License	176	173	173	33	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
245	Acc-69	Recurring License	298	301	301	46	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
246	Acc-70	Maintenance	-	-	-	-	-	-	-	-	50	Momento	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1				Total relevant revenue \$	Company Yearly Profit	Total relevant profit \$																						
2			2018	\$ 3,900,371.07	0%	\$ -																						
3			2019	\$ 7,161,342.17	0.9%	\$ 64,452.08																						
4			2020	\$ 4,181,758.15	0%	\$ -																						
5																												
6	Account No.	Deal Type	Q2'2018 Revenue [K\$]	Q3'2018 Revenue [K\$]	Q4'2018 Revenue [K\$]	Q1'2019 Revenue [K\$]	Q2'2019 Revenue [K\$]	Q3'2019 Revenue [K\$]	Q4'2019 Revenue [K\$]	Q1'2020 Revenue [K\$]	Q2'2020 Revenue [K\$]	Product	Total sum [K\$] for relevant revenue within 2018	Total sum [K\$] for relevant revenue within 2019	Total sum [K\$] for relevant revenue within 2020	Total sum [K\$] for relevant revenue within 29/04/2018 -	Information source category	Covert iOS was provided	Triggere d iOS was provided	Covert Android was provided	Triggere d Android was provided	Covert Android deal portion	maintenan ce related	Final calculation of relevant revenue [K\$] 2018	Final calculation of relevant revenue [K\$] 2019	Final calculation of relevant revenue [K\$] 2020	Final calculation of relevant revenue [K\$] 2018-2020	Final relevant profit 2018-2020 [K\$]
247	Acc-70	Maintenance	-	-	-	-	-	-	-	-	388	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
248	Acc-70	New Business	-	-	-	755	53	54	54	53	-	Momento	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
249	Acc-70	New Business	-	-	-	5,859	407	417	417	412	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
250	Acc-70	New Business	88	-	-	-	-	-	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
251	Acc-71	Maintenance	-	-	-	-	-	-	116	329	329	PGS	0	0	362	362	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.17	0.45	-	-	27.95	27.95	-
252	Acc-71	New Business	-	-	4,796	333	330	332	209	-	-	PGS	4780	511	0	5,291	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.17	1.00	812.57	86.85	-	899.43	0.78
253	Acc-72	Maintenance	-	-	-	-	-	-	58	110	110	PGS	0	0	121	121	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.25	0.45	-	-	13.70	13.70	-
254	Acc-72	Maintenance	-	-	-	-	-	38	122	120	120	PGS	0	0	132	132	Contract=GBO	No	Yes	No	No	0	-	-	-	-	-	-
255	Acc-72	New Business	-	-	1,618	109	110	111	52	-	-	PGS	1696	168	0	1,864	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	0.25	1.00	424.01	42.01	-	466.02	0.38
256	Acc-72	New Business	121	121	121	119	121	84	-	-	-	PGS	104	184	0	288	Contract=GBO	No	Yes	No	Yes	0	-	-	-	-	-	-
257	Acc-72	Upsell	-	-	-	-	-	-	707	55	55	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
258	Acc-72	Upsell	-	-	-	-	-	-	948	74	74	PGS	0	0	81	81	Contract=GBO	(blank)	(blank)	No	(blank)	0	-	-	-	-	-	-
259	Acc-73	Maintenance	-	-	-	-	-	-	-	110	-	PGS	0	0	72	72	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	-	-	8.22	8.22	-
260	Acc-73	Maintenance	-	154	51	-	-	-	-	-	-	PGS	44	0	0	44	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	5.01	-	-	5.01	-
261	Acc-73	New Business	7	7	7	7	7	7	7	7	7	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
262	Acc-73	New Business	20	20	20	22	20	21	20	22	22	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
263	Acc-74	Maintenance	62	302	239	-	-	-	-	-	-	PGS	206	0	0	206	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	0.45	23.36	-	-	23.36	-
264	Acc-74	Maintenance	188	-	-	-	-	-	-	-	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
265	Acc-74	Maintenance	263	266	(113)	-	-	-	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
266	Acc-74	Upsell	-	-	2,958	-	-	-	-	-	-	PGS	0	0	0	-	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	0.25	-	-	-	-	-	-
267	Acc-74	Upsell	-	-	4,154	-	-	-	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
268	Acc-74	Upsell	5	5	5	2	-	-	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
269	Acc-74	Upsell	26	12	-	-	-	-	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
270	Acc-75	Maintenance	-	-	-	-	-	-	-	30	130	PGS	0	0	77	77	Contract - included GBO - included & elaborated	No	Yes	Yes	Yes	0.40984	0.45	-	-	14.36	14.36	-

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1				Total relevant revenue \$	Company Yearly Profit	Total relevant profit \$																						
2			2018	\$ 3,900,371.07	0%	\$ -																						
3			2019	\$ 7,161,342.17	0.9%	\$ 64,452.08																						
4			2020	\$ 4,181,758.15	0%	\$ -																						
5																												
6	Account No.	Deal Type	Q2'2018 Revenue [K\$]	Q3'2018 Revenue [K\$]	Q4'2018 Revenue [K\$]	Q1'2019 Revenue [K\$]	Q2'2019 Revenue [K\$]	Q3'2019 Revenue [K\$]	Q4'2019 Revenue [K\$]	Q1'2020 Revenue [K\$]	Q2'2020 Revenue [K\$]	Product	Total sum [K\$] for relevant revenue within 2018	Total sum [K\$] for relevant revenue within 2019	Total sum [K\$] for relevant revenue within 2020	Total sum [K\$] for relevant revenue within 29/04/2018 -	Information source category	Covert iOS was provided	Triggere d iOS was provided	Covert Android was provided	Triggere d Android was provided	Covert Android deal portion	maintenan ce related	Final calculation of relevant revenue [K\$] 2018	Final calculation of relevant revenue [K\$] 2019	Final calculation of relevant revenue [K\$] 2020	Final calculation of relevant revenue [K\$] 2018-2020	Final relevant profit 2018-2020 [K\$]
271	Acc-75	Maintenance	-	-	-	-	-	-	144	144	144	PGS	0	0	158	158	Contract=GBO	(blank)	(blank)	No	(blank)	0	-	-	-	-	-	-
272	Acc-75	Maintenance	-	-	-	-	-	112	113	110	110	PGS	0	0	121	121	Contract=GBO	(blank)	(blank)	No	(blank)	0	-	-	-	-	-	-
273	Acc-75	Maintenance	-	-	107	112	103	108	-	-	-	PGS	91	168	0	260	Contract=GBO	(blank)	(blank)	No	(blank)	0	-	-	-	-	-	-
274	Acc-75	Maintenance	-	117	117	117	117	-	-	-	-	PGS	100	179	0	279	Contract=GBO	(blank)	(blank)	No	(blank)	0	-	-	-	-	-	-
275	Acc-75	Maintenance	115	-	-	-	-	-	-	-	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-	-
276	Acc-75	Upsell	-	-	-	-	-	-	1,341	84	84	PGS	0	0	93	93	Contract=GBO	(blank)	(blank)	No	(blank)	0	-	-	-	-	-	-
277	Acc-75	Upsell	-	-	-	630	44	43	43	32	-	PGS	0	653	21	674	Contract - included GBO - included & elaborated	No	Yes	Yes	Yes	0.40984	1.00	-	267.66	8.62	276.28	2.41
278	Acc-75	Upsell	-	-	1,292	89	91	92	92	-	-	PGS	0	139	0	139	Contract - included GBO - included & elaborated	No	Yes	Yes	Yes	0.40984	1.00	-	56.77	-	56.77	0.51
279	Acc-75	Upsell	44	44	44	46	44	45	-	-	-	PGS	38	70	0	107	Contract=GBO	(blank)	(blank)	No	(blank)	0	-	-	-	-	-	-
280	Acc-75	Upsell	107	71	-	-	-	-	-	-	-	PGS	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-	-
281	Acc-76	Maintenance	-	-	-	-	-	-	-	142	219	PGS	0	0	190	190	Contract=GBO	No	Yes	No	Yes	0	-	-	-	-	-	-
282	Acc-76	Upsell	-	-	-	3,265	220	219	221	75	-	PGS	0	3383	49	3,433	Contract=GBO	No	Yes	No	Yes	0	-	-	-	-	-	-
283	Acc-77	New Business	-	-	-	-	-	-	-	3,614	257	Storm	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-	-
284	Acc-77	New Business	-	-	-	-	-	-	-	4,422	315	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-	-
285	Acc-77	New Business	-	-	-	-	-	-	-	7,441	530	PGS	0	0	7674	7,674	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	12%	1.00	-	-	931.81	931.81	-
286	Acc-78	New Business	-	-	270	7	8	8	7	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-	-
287	Acc-79	Maintenance	-	-	-	-	-	-	-	135	316	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-	-
288	Acc-79	Maintenance	-	-	-	-	-	-	-	2,002	4,671	PGS	0	0	3373	3,373	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	25%	0.45	-	-	383.28	383.28	-
289	Acc-79	Upsell	-	-	-	-	17,672	900	924	504	-	PGS	0	0	333	333	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	25%	1.00	-	-	83.14	83.14	-
290	Acc-80	New Business	225	227	227	220	-	-	-	-	-	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-	-
291	Acc-80	New Business	315	318	270	-	-	-	-	-	-	PGS	232	0	0	232	Contract=GBO	(blank)	(blank)	No	(blank)	0%	-	-	-	-	-	-
292	Acc-80	New Business	2,025	2,047	1,357	-	-	-	-	-	-	PGS	1166	0	0	1,166	Contract - not definitive GBO - not included Escalated to full portfolio	Yes	Yes	Yes	Yes	25%	1.00	291.40	-	-	291.40	-
293	Acc-80	New Business	19,008	1,001	1,001	979	11	-	-	-	-	PGS	859	985	0	1,844	Contract=GBO	(blank)	(blank)	No	(blank)	0%	-	-	-	-	-	-

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1				Total relevant revenue \$	Company Yearly Profit	Total relevant profit \$																						
2			2018	\$ 3,900,371.07	0%	\$ -																						
3			2019	\$ 7,161,342.17	0.9%	\$ 64,452.08																						
4			2020	\$ 4,181,758.15	0%	\$ -																						
5																												
6	Account No.	Deal Type	Q2'2018 Revenue [K\$]	Q3'2018 Revenue [K\$]	Q4'2018 Revenue [K\$]	Q1'2019 Revenue [K\$]	Q2'2019 Revenue [K\$]	Q3'2019 Revenue [K\$]	Q4'2019 Revenue [K\$]	Q1'2020 Revenue [K\$]	Q2'2020 Revenue [K\$]	Product	Total sum [K\$] for relevant revenue within 2018	Total sum [K\$] for relevant revenue within 2019	Total sum [K\$] for relevant revenue within 2020	Total sum [K\$] for relevant revenue within 29/04/2018 -	Information source category	Covert iOS was provided	Triggere d iOS was provided	Covert Android was provided	Triggere d Android was provided	Covert Android deal portion	maintenan ce related	Final calculation of relevant revenue [K\$] 2018	Final calculation of relevant revenue [K\$] 2019	Final calculation of relevant revenue [K\$] 2020	Final calculation of relevant revenue [K\$] 2018-2020	Final relevant profit 2018-2020 [K\$]
294	Acc-81	Maintenance	-	-	-	-	-	-	46	140	140	PGS	0	0	153	153	Contract - not definitive GBO - not included Escalated to full portfolio	Yes	Yes	Yes	Yes	25%	0.45	-	-	17.43	17.43	-
295	Acc-81	Maintenance	-	-	233	142	140	44	1	-	-	PGS	200	217	0	418	Contract - not definitive GBO - not included Escalated to full portfolio	Yes	Yes	Yes	Yes	25%	0.45	22.77	24.70	-	47.47	0.22
296	Acc-82	Maintenance	-	-	-	-	-	-	-	26	213	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
297	Acc-82	New Business	-	-	-	3,032	211	214	214	184	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
298	Acc-83	Maintenance	-	-	-	-	50	38	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
299	Acc-83	Maintenance	-	-	-	176	175	174	175	-	-	PGS	0	270	0	270	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	25%	0.45	-	30.73	-	30.73	0.28
300	Acc-83	Maintenance	-	-	-	210	106	106	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
301	Acc-83	Maintenance	116	117	-	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
302	Acc-83	Maintenance	175	175	175	47	-	-	-	-	-	PGS	150	47	0	197	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	25%	0.45	17.08	5.32	-	22.40	0.05
303	Acc-83	Upsell	38	38	38	20	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
304	Acc-84	Maintenance	-	-	-	107	43	21	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
305	Acc-84	Recurring License	-	187	-	374	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
306	Acc-85	New Business	-	-	-	-	-	2,872	195	195	195	PGS	0	0	215	215	Contract - missing information Escalated to full portfolio	Yes	Yes	Yes	Yes	25%	1.00	-	-	53.70	53.70	-
307	Acc-86	Recurring License	-	-	(212)	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
308	Acc-87	New Business	-	-	-	-	-	-	3,200	110	199	PGS	0	0	160	160	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	24%	1.00	-	-	37.63	37.63	-
309	Acc-87	New Business	-	-	-	-	-	1,760	-	60	110	PIX	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
310	Acc-87	New Business	-	-	-	-	-	7,000	-	240	436	PGS	0	0	350	350	Contract - included GBO - included & elaborated	Yes	Yes	Yes	Yes	24%	1.00	-	-	82.32	82.32	-
311	Acc-87	New Business	-	-	-	-	4,800	-	-	164	299	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
312	Acc-88	Maintenance	-	-	-	-	-	83	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
313	Acc-88	Maintenance	-	-	41	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
314	Acc-89	Maintenance	7	-	-	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
315	Acc-89	Upsell	5	-	-	-	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1				Total relevant revenue \$	Company Yearly Profit	Total relevant profit \$																						
2			2018	\$ 3,900,371.07	0%	\$ -																						
3			2019	\$ 7,161,342.17	0.9%	\$ 64,452.08																						
4			2020	\$ 4,181,758.15	0%	\$ -																						
5																												
6	Account No.	Deal Type	Q2'2018 Revenue [K\$]	Q3'2018 Revenue [K\$]	Q4'2018 Revenue [K\$]	Q1'2019 Revenue [K\$]	Q2'2019 Revenue [K\$]	Q3'2019 Revenue [K\$]	Q4'2019 Revenue [K\$]	Q1'2020 Revenue [K\$]	Q2'2020 Revenue [K\$]	Product	Total sum [K\$] for relevant revenue within 2018	Total sum [K\$] for relevant revenue within 2019	Total sum [K\$] for relevant revenue within 2020	Total sum [K\$] for relevant revenue within 29/04/2018 -	Information source category	Covert iOS was provided	Triggere d iOS was provided	Covert Android was provided	Triggere d Android was provided	Covert Android deal portion	maintenan ce related portion	Final calculation of relevant revenue [K\$] 2018	Final calculation of relevant revenue [K\$] 2019	Final calculation of relevant revenue [K\$] 2020	Final calculation of relevant revenue [K\$] 2018-2020	Final relevant profit 2018-2020 [K\$]
316	Acc-90	New Business	194	196	196	94	-	-	-	-	-	LDM	0	0	0	-	(blank)	(blank)	(blank)	(blank)	(blank)	(blank)	-	-	-	-	-	-
317	Acc-90	New Business	452	457	457	219	-	-	-	-	-	PGS	392	219	0	611	Contract - not definitive GBO - not included Escalated to full portfolio	Yes	Yes	Yes	Yes	25%	1.00	98.10	54.64	-	152.74	0.49

EXHIBIT 40

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment

Infrastructure Related to Exploit Targeting WA VOIP Vulnerability

c2 servers believed to be used to deliver malicious payloads (malware)

	IP Address of C2 Server	ASN	Subnet	Provider	Country Location of Provider	Provider Full Name
1				GREENCLOUDVPS-AS	VN	365 Online technology joint stock company, VN
2				SNL	HK	HK Starry Network Limited, HK
3				EXBCOID-AS	ID	AP PT. EXABYTES NETWORK INDONESIA, ID
4				ASN-QUADRANET-GLOBAL	US	QuadraNet Enterprises LLC, US
5				IOMART	GB	AS, GB
6				UKSERVERS	GB	AS UK Dedicated Servers, Hosting and Co-Location, GB
7				UKSERVERS	GB	AS UK Dedicated Servers, Hosting and Co-Location, GB
8				UKSERVERS	GB	AS UK Dedicated Servers, Hosting and Co-Location, GB
9				UKSERVERS	GB	AS UK Dedicated Servers, Hosting and Co-Location, GB
10				PORTLANE	SE	www.portlane\com, SE
11				HZ-NL	GB	

12				WORLDSTREAM,	NL	
13				NET23	HU	
14				NET23	HU	
15				NET23	HU	
16				NET23	HU	
17				NET23	HU	
18				NET23	HU	
19				NET23	HU	
20				NET23	HU	
21				NET23	HU	
22				HostSailer	AE	
23				YISP	NL	
24				YISP	NL	
25				YISP	NL	
26				HS	AE	
27				TTM	DE	
28				IOMART	GB	
29				IOMART	GB	
30				DATACLUB	LV	
31				HZ-NL	GB	
32				IOMART	GB	
33				AMAZON-02	US	Amazon\com, Inc., US
34				PORTLANE	SE	www.portlane\com, SE
35				PORTLANE	SE	www.portlane\com, SE
36				IOMART	GB	
37				IOMART	GB	
38				UKSERVERS	GB	AS UK Dedicated Servers, Hosting and Co-Location, GB
39				UKSERVERS	GB	AS UK Dedicated Servers, Hosting and Co-Location, GB
40				UKSERVERS	GB	AS UK Dedicated Servers, Hosting and Co-Location, GB

41		AS-CHOOPA	US	Choopa, LLC, US
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Passive DNS for [REDACTED] showing NSO domains resolving to that IP:

	A	B	C
1	Domain	First Seen	Last Seen
2	sip.q\co	2018-03-27 09:19:49	2019-05-08 10:31:54
3	sip.nsogroup\com	2018-01-16 11:10:46	2019-05-06 02:49:09
4	sip.qtechnologies\com	2018-10-03 21:08:22	2019-05-03 20:35:25
5	access.nsogroup\com	2018-01-16 11:10:46	2018-03-20 12:59:47

resolve,firstSeen,lastSeen,source,tags

sip.q.co,2018-03-27 09:19:49,2019-05-08 10:31:54,kaspersky|pingly|riskiq,
sip.nsogroup.com,2018-01-16 11:10:46,2019-05-06 02:49:09,kaspersky|pingly|riskiq,
sip.qtechnologies.com,2018-10-03 21:08:22,2019-05-03 20:35:25,kaspersky|pingly|riskiq,
sip.2access.xyz,2018-10-05 23:34:30,2019-03-30 22:38:41,kaspersky|pingly|riskiq,
access.2access.co,2018-03-27 03:42:49,2019-01-04 02:32:18,kaspersky|pingly|riskiq,
ec2-[REDACTED]eu-central-1.compute.amazonaws.com,2017-12-05 17:29:48,2019-01-03 09:53:35,riskiq,
access.nsogroup.com,2018-01-16 11:10:46,2018-03-20 12:59:47,pingly|riskiq,

Attacker to Target Numbers

The following WA numbers appear to have been used by the attackers to send the first stage of the exploit to at least one individual in the United States and other individuals in multiple countries, including Mexico, Bahrain, Algeria, Morocco, India, Pakistan, Uzbekistan, and other locations.

	Attacker Phone (Distinct)	Attacker Phone Locale	Total Attacker Phones/Locale
1	[REDACTED]	Austria Europe	2
2	[REDACTED]	Austria Europe	

3		Cyprus Asia	56
4		Cyprus Asia	
5		Cyprus Asia	
6		Cyprus Asia	
7		Cyprus Asia	
8		Cyprus Asia	
9		Cyprus Asia	
10		Cyprus Asia	
11		Cyprus Asia	
12		Cyprus Asia	
13		Cyprus Asia	
14		Cyprus Asia	
15		Cyprus Asia	
16		Cyprus Asia	
17		Cyprus Asia	
18		Cyprus Asia	
19		Cyprus Asia	
20		Cyprus Asia	
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35		Cyprus Asia	
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47		Cyprus Asia	
48		Cyprus Asia	
49		Cyprus Asia	
50		Cyprus Asia	
51		Cyprus Asia	
52		Cyprus Asia	
53		Cyprus Asia	
54		Cyprus Asia	
55		Cyprus Asia	
56		Cyprus Asia	
57		Cyprus Asia	
58		Cyprus Asia	
59		Czech Republic Europe	1
60		Indonesia Asia	9
61		Indonesia Asia	
62		Indonesia Asia	
63		Indonesia Asia	
64		Indonesia Asia	
65		Indonesia Asia	
66		Indonesia Asia	

67		Indonesia Asia	
68		Indonesia Asia	
69		Israel Asia	1
70		Netherlands Europe	39
71		Netherlands Europe	
72		Netherlands Europe	
73		Netherlands Europe	
74		Netherlands Europe	
75		Netherlands Europe	
76		Netherlands Europe	
77		Netherlands Europe	
78		Netherlands Europe	
79		Netherlands Europe	
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104		Netherlands Europe	
105		Netherlands Europe	
106		Netherlands Europe	
107		Netherlands Europe	
108		Netherlands Europe	
109		South Africa Africa	1
110		Sweden Europe	60
111		Sweden Europe	
112		Sweden Europe	
113		Sweden Europe	
114		Sweden Europe	
115		Sweden Europe	
116		Sweden Europe	
117		Sweden Europe	
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163		Sweden Europe	
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165		Sweden Europe	
166		Sweden Europe	
167		Sweden Europe	
168		Sweden Europe	
169		Sweden Europe	
170		Turkey Asia	1

Victim Country Count

	Victim Country	Count
1	Mexico, North America	456
2	India, Asia	100
3	Bahrain, Asia	82
4	Morocco, Africa	69
5	Pakistan, Asia	58
6	Indonesia, Asia	54
7	Israel, Asia	51
8	Uzbekistan, Asia	43
9	Algeria, Africa	38
10	Cyprus, Asia	31
11	Turkey, Asia	26
12	Spain, Europe	21
13	Uganda, Africa	18
14	Togo, Africa	16
15	Netherlands, Europe	11
16	Syria, Asia	11
17	Democratic Republic of the Congo, Africa	10
18	Djibouti, Africa	10
19	Lebanon, Asia	9
20	South Africa, Africa	9
21	Hungary, Europe	8
22	Croatia, Europe	7

23	France, Europe	7
24	Kazakhstan, Asia	7
25	Latvia, Europe	7
26	Kyrgyzstan, Asia	6
27	United Arab Emirates, Asia	6
28	Estonia, Europe	5
29	Belgium, Europe	4
30	Burundi, Africa	4
31	Finland, Europe	4
32	Brazil, South America	3
33	Rwanda, Africa	3
34	Singapore, Asia	3
35	Sudan, Africa	3
36	Switzerland, Europe	3
37	Germany, Europe	2
38	Kenya, Africa	2
39	Qatar, Asia	2
40	Tanzania, Africa	2
41	United Kingdom, Europe	2
42	Afghanistan, Asia	1
43	Barbados, North America	1
44	Bosnia and Herzegovina, Europe	1
45	Canada, North America	1
46	Egypt, Africa	1
47	Peru, South America	1
48	Thailand, Asia	1
49	Venezuela, South America	1
50	Yemen, Asia	1
51	United States, North America	1

The following errors were encountered while copying your document:
- An error occurred while attempting to fix Embedded Tables.

EXHIBIT 41

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment

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userid	wa_sk	account	account_type	last_active	registration	deletion_reason	deletion_time	current_country	transfer_dates	transfers	num_transfer
	6103743987	attacker	attacker	5/5/2019	2/18/2019	purge	6/4/2019	NL			1
	6108289999	attacker	attacker	5/6/2019	2/19/2019	purge	6/5/2019	CY			1
	6334562024	attacker	attacker	5/9/2019	4/3/2019	purge	6/8/2019	NL			1
	6205347333	attacker	attacker	5/5/2019	3/10/2019	purge	6/4/2019	CY			1
	6151092881	attacker	attacker	5/6/2019	2/27/2019	purge	7/7/2019	SE			1
	6108210128	attacker	attacker	4/30/2019	2/19/2019	purge	7/1/2019	SE			1
	6149450483	attacker	attacker	5/8/2019	2/27/2019	purge	7/9/2019	NL			1
	6050032579	attacker	attacker	5/5/2019	2/8/2019	purge	7/6/2019	NL			1
	6500203792	attacker	attacker	5/12/2019	5/5/2019	purge	6/17/2019	CY			1
	5744876452	attacker	attacker	5/2/2019	12/13/2018	purge	7/3/2019	IL			1
	6153549116	attacker	attacker	5/8/2019	2/28/2019	purge	7/9/2019	ID			1
	6499248604	attacker	attacker	5/6/2019	5/5/2019	purge	6/5/2019	CY			1
	6022847519	attacker	attacker	5/12/2019	2/3/2019	purge	6/17/2019	CY			1
	6155579743	attacker	attacker	5/4/2019	2/28/2019	purge	6/3/2019	NL			1
	6102570691	attacker	attacker	5/5/2019	2/18/2019	purge	6/4/2019	SE			1
	6357577570	NSO	NSO Group	5/2/2019	4/8/2019	purge	7/9/2019	IL	["2019-04-23","2019-04-15"]	["IN -> IL","IL -> IN"]	2
	6105974611	attacker	attacker	5/7/2019	2/18/2019	purge	6/6/2019	NL			1
	6106812082	attacker	attacker	5/6/2019	2/19/2019	purge	6/5/2019	CY			1
	6478849795	attacker	attacker	5/2/2019	5/1/2019	purge	6/2/2019	CY			1
	6005916338	attacker	attacker	5/12/2019	1/30/2019	purge	6/17/2019	SE			1
	5732503229	attacker	attacker	5/6/2019	12/10/2018	purge	7/7/2019	SE			1
	6146761662	attacker	attacker	5/6/2019	2/26/2019	purge	7/7/2019	SE			1
	5663498053	NSO	NSO Group	2/11/2019	11/27/2018	purge	4/20/2019	IL			1
	6002339476	attacker	attacker	5/12/2019	1/30/2019	purge	6/17/2019	SE			1
	6258373447	attacker	attacker	5/2/2019	3/20/2019	purge	7/3/2019	NL			1
	6500404661	attacker	attacker	5/5/2019	5/5/2019	purge	6/5/2019	CY			1
	6024496487	attacker	attacker	5/12/2019	2/3/2019	purge	6/17/2019	CY			1
	6109448239	attacker	attacker	5/7/2019	2/19/2019	purge	7/8/2019	SE			1
	6206331649	attacker	attacker	5/5/2019	3/10/2019	purge	6/4/2019	CY			1
	6002816412	attacker	attacker	5/12/2019	1/30/2019	purge	6/17/2019	SE			1
	6216603413	attacker	attacker	5/3/2019	3/12/2019	purge	6/3/2019	SE			1
	6504044703	attacker	attacker	5/7/2019	5/6/2019	purge	6/6/2019	CY			1
	6099324154	attacker	attacker	5/8/2019	2/17/2019	purge	7/9/2019	NL			1
	6207724985	attacker	attacker	5/5/2019	3/10/2019	purge	6/4/2019	CY			1
	6218708984	attacker	attacker	5/3/2019	3/12/2019	purge	6/3/2019	CY			1
	6218150132	attacker	attacker	5/4/2019	3/12/2019	purge	6/3/2019	NL			1
	6301207753	attacker	attacker	4/30/2019	3/28/2019	purge	7/1/2019	CY			1
	6109953296	attacker	attacker	5/6/2019	2/19/2019	purge	6/5/2019	CY			1
	6472543390	attacker	attacker	5/2/2019	4/30/2019	purge	6/2/2019	CY			1
	6394764087	attacker	attacker	5/5/2019	4/15/2019	purge	7/7/2019	CY			1
	6152974278	attacker	attacker	5/3/2019	2/28/2019	purge	6/3/2019	NL			1
	6153573186	attacker	attacker	5/8/2019	2/28/2019	purge	7/9/2019	ID			1
	6108203369	attacker	attacker	5/6/2019	2/19/2019	purge	6/6/2019	NL			1
	6061647976	NSO	NSO Group	5/2/2019	2/10/2019	purge	7/9/2019	IL	["2019-04-18","2019-03-17","2019-03-27","2019-04-14","2019-04-08","2019-03-31"]	["IN -> IL","IL -> ID","ID -> IL","IL -> IN","SG -> IL","IL -> SG"]	6

userid	wa_sk	account	account_type	last_active	registration	deletion_reason	deletion_time	current_country	transfer_dates	transfers	num_transfer
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	6506415140	attacker	attacker	5/7/2019	5/6/2019	purge	6/6/2019	CY			1
	6205049002	attacker	attacker	5/5/2019	3/10/2019	purge	6/4/2019	CY			1
	6504646455	attacker	attacker	5/7/2019	5/6/2019	purge	6/6/2019	CY			1
	6513224559	attacker	attacker	5/8/2019	5/8/2019	purge	6/7/2019	CY			1
	6156905113	attacker	attacker	5/8/2019	2/28/2019	purge	7/9/2019	ID			1
	6208790002	attacker	attacker	5/4/2019	3/10/2019	purge	6/3/2019	SE			1
	6104008493	attacker	attacker	5/5/2019	2/18/2019	purge	6/4/2019	SE			1
	6477477878	attacker	attacker	5/1/2019	5/1/2019	purge	6/2/2019	CY			1
	6120017825	attacker	attacker	5/6/2019	2/21/2019	purge	6/5/2019	SE			1
	6299619093	attacker	attacker	4/30/2019	3/28/2019	purge	7/1/2019	CY			1
	6156837889	attacker	attacker	5/8/2019	2/28/2019	purge	7/9/2019	ID			1
	6392792360	attacker	attacker	5/5/2019	4/15/2019	purge	7/7/2019	CY			1

EXHIBIT 42

to Declaration of Micah G. Block in Support of
Plaintiffs' Opposition to Defendants' Motion for
Summary Judgment or Partial Summary Judgment

Document Produced in Native Format

userid	wa_sk	account	account_type	last_active	registration	deletion_reason	deletion_time	current_country	transfer_dates	transfers	num_transfer
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	6243581667	attacker	attacker	5/4/2019	3/17/2019	natural	5/4/2019	ID			1
	6029451264	attacker	attacker	5/12/2019	2/4/2019			SE			1
	6076902872	attacker	attacker	5/10/2019	2/13/2019			SE			1
	6103743987	attacker	attacker	5/5/2019	2/18/2019	purge	6/4/2019	NL			1
	6108289999	attacker	attacker	5/6/2019	2/19/2019	purge	6/5/2019	CY			1
	6028162683	attacker	attacker	5/10/2019	2/4/2019			NL			1
	6334562024	attacker	attacker	5/9/2019	4/3/2019	purge	6/8/2019	NL			1
	6501096241	attacker	attacker	5/12/2019	5/5/2019			CY			1
	6368836156	attacker	attacker	5/12/2019	4/10/2019			CY			1
	6004453026	attacker	attacker	5/12/2019	1/30/2019			SE			1
	6469249783	attacker	attacker	5/12/2019	4/29/2019			CY			1
	6152786953	attacker	attacker	5/12/2019	2/28/2019			NL			1
	6205347333	attacker	attacker	5/5/2019	3/10/2019	purge	6/4/2019	CY			1
	6503225476	attacker	attacker	5/12/2019	5/6/2019			ID			1
	6078718634	attacker	attacker	5/12/2019	2/13/2019			SE			1
	6151092881	attacker	attacker	5/6/2019	2/27/2019	purge	7/7/2019	SE			1
	6098770247	attacker	attacker	5/10/2019	2/17/2019			SE			1
	6325260330	attacker	attacker	5/11/2019	4/2/2019			CY			1
	6032145169	attacker	attacker	5/12/2019	2/4/2019			SE			1
	6262392959	attacker	attacker	5/12/2019	3/20/2019			SE			1
	6082128641	attacker	attacker	5/10/2019	2/14/2019			SE			1
	6108210128	attacker	attacker	4/30/2019	2/19/2019	purge	7/1/2019	SE			1
	6208986194	attacker	attacker	5/12/2019	3/10/2019			SE			1
	6212034284	attacker	attacker	5/10/2019	3/11/2019			SE			1
	6149450483	attacker	attacker	5/8/2019	2/27/2019	purge	7/9/2019	NL			1
	6267490104	attacker	attacker	5/12/2019	3/21/2019			SE			1
	6050032579	attacker	attacker	5/5/2019	2/8/2019	purge	7/6/2019	NL			1
	6179538473	attacker	attacker	7/3/2019	3/5/2019			US			1
	6143676951	attacker	attacker	5/12/2019	2/26/2019			NL			1
	6500203792	attacker	attacker	5/12/2019	5/5/2019	purge	6/17/2019	CY			1
	6467895549	attacker	attacker	5/12/2019	4/29/2019			CY			1
	5744876452	attacker	attacker	5/2/2019	12/13/2018	purge	7/3/2019	IL			1
	6153549116	attacker	attacker	5/8/2019	2/28/2019	purge	7/9/2019	ID			1
	6499248604	attacker	attacker	5/6/2019	5/5/2019	purge	6/5/2019	CY			1
	6121335644	attacker	attacker	5/12/2019	2/21/2019			SE			1
	6355080920	attacker	attacker	5/11/2019	4/7/2019			CY			1
	6022847519	attacker	attacker	5/12/2019	2/3/2019	purge	6/17/2019	CY			1
	6256086398	attacker	attacker	5/12/2019	3/19/2019			SE			1
	6113150304	attacker	attacker	5/9/2019	2/20/2019			NL			1
	6032563548	attacker	attacker	5/10/2019	2/4/2019			NL			1
	6154923185	attacker	attacker	5/13/2019	2/28/2019			SE			1
	5509702620	attacker	attacker	5/24/2019	10/29/2018			US			1
	6155579743	attacker	attacker	5/4/2019	2/28/2019	purge	6/3/2019	NL			1
	6077635271	attacker	attacker	5/11/2019	2/13/2019			NL			1
	6102570691	attacker	attacker	5/5/2019	2/18/2019	purge	6/4/2019	SE			1
	6259834569	attacker	attacker	5/11/2019	3/20/2019			SE			1
	6247183445	attacker	attacker	5/12/2019	3/18/2019			SE			1
	6210905678	attacker	attacker	5/10/2019	3/11/2019			SE			1
	6105974611	attacker	attacker	5/7/2019	2/18/2019	purge	6/6/2019	NL			1

userid	wa_sk	account	account_type	last_active	registration	deletion_reason	deletion_time	current_country	transfer_dates	transfers	num_transfer
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	6106812082	attacker	attacker	5/6/2019	2/19/2019	purge	6/5/2019	CY			1
	6367649888	attacker	attacker	5/12/2019	4/10/2019			NL			1
	6103780102	attacker	attacker	5/9/2019	2/18/2019			SE			1
	6478849795	attacker	attacker	5/2/2019	5/1/2019	purge	6/2/2019	CY			1
	6005916338	attacker	attacker	5/12/2019	1/30/2019	purge	6/17/2019	SE			1
	6114856199	attacker	attacker	5/11/2019	2/20/2019			SE			1
	6051518815	attacker	attacker	5/12/2019	2/8/2019			NL			1
	6076081163	attacker	attacker	5/10/2019	2/13/2019			NL			1
	5732503229	attacker	attacker	5/6/2019	12/10/2018	purge	7/7/2019	SE			1
	6077823677	attacker	attacker	5/12/2019	2/13/2019			SE			1
	6146761662	attacker	attacker	5/6/2019	2/26/2019	purge	7/7/2019	SE			1
	6050401515	attacker	attacker	5/12/2019	2/8/2019			NL			1
	6040981076	attacker	attacker	5/10/2019	2/6/2019			NL			1
	6047995313	attacker	attacker	5/10/2019	2/7/2019			NL			1
	6081075313	attacker	attacker	5/12/2019	2/14/2019			SE			1
	6259442613	attacker	attacker	5/10/2019	3/20/2019			NL			1
	6002339476	attacker	attacker	5/12/2019	1/30/2019	purge	6/17/2019	SE			1
	6076252847	attacker	attacker	5/12/2019	2/13/2019			SE			1
	6258373447	attacker	attacker	5/2/2019	3/20/2019	purge	7/3/2019	NL			1
	6032654071	attacker	attacker	5/9/2019	2/4/2019			CY			1
	6500404661	attacker	attacker	5/5/2019	5/5/2019	purge	6/5/2019	CY			1
	6070521361	attacker	attacker	5/12/2019	2/12/2019			NL			1
	6024496487	attacker	attacker	5/12/2019	2/3/2019	purge	6/17/2019	CY			1
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	6247061970	attacker	attacker	5/12/2019	3/18/2019			SE			1
	6078252728	attacker	attacker	5/10/2019	2/13/2019			SE			1
	6120394832	attacker	attacker	5/12/2019	2/21/2019			SE			1
	6105563586	attacker	attacker	5/12/2019	2/18/2019			SE			1
	6206331649	attacker	attacker	5/5/2019	3/10/2019	purge	6/4/2019	CY			1
	6337444467	attacker	attacker	5/9/2019	4/4/2019			NL			1
	6143553766	attacker	attacker	5/12/2019	2/26/2019			SE			1
	6002816412	attacker	attacker	5/12/2019	1/30/2019	purge	6/17/2019	SE			1
	6216603413	attacker	attacker	5/3/2019	3/12/2019	purge	6/3/2019	SE			1
	6114552550	attacker	attacker	5/12/2019	2/20/2019			SE			1
	6050764839	attacker	attacker	5/11/2019	2/8/2019			NL			1
	6329156411	attacker	attacker	5/12/2019	4/2/2019			CY			1
	6504044703	attacker	attacker	5/7/2019	5/6/2019	purge	6/6/2019	CY			1
	6187021912	attacker	attacker	7/9/2019	3/6/2019			US			1
	6099324154	attacker	attacker	5/8/2019	2/17/2019	purge	7/9/2019	NL			1
	6207724985	attacker	attacker	5/5/2019	3/10/2019	purge	6/4/2019	CY			1
	6218708984	attacker	attacker	5/3/2019	3/12/2019	purge	6/3/2019	CY			1
	6101002346	attacker	attacker	5/12/2019	2/17/2019			SE			1
	6256288700	attacker	attacker	5/9/2019	3/19/2019			SE			1
	6216568907	attacker	attacker	5/12/2019	3/12/2019			SE			1
	6109548904	attacker	attacker	5/12/2019	2/19/2019			SE			1
	6082767014	attacker	attacker	5/10/2019	2/14/2019			SE			1
	6218150132	attacker	attacker	5/4/2019	3/12/2019	purge	6/3/2019	NL			1
	6301207753	attacker	attacker	4/30/2019	3/28/2019	purge	7/1/2019	CY			1

userid	wa_sk	account	account_type	last_active	registration	deletion_reason	deletion_time	current_country	transfer_dates	transfers	num_transfer
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	6109953296	attacker	attacker	5/6/2019	2/19/2019	purge	6/5/2019	CY			1
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	6108486367	attacker	attacker	5/7/2019	2/19/2019			CY			1
	6121451178	attacker	attacker	5/9/2019	2/21/2019			SE			1
	6242775066	attacker	attacker	5/12/2019	3/17/2019			ID			1
	6085286680	attacker	attacker	5/11/2019	2/14/2019			NL			1
	6148701473	attacker	attacker	5/12/2019	2/27/2019			SE			1
	6053747406	attacker	attacker	5/10/2019	2/8/2019			NL			1
	5893135494	attacker	attacker	5/8/2019	1/9/2019			CY			1
	6472543390	attacker	attacker	5/2/2019	4/30/2019	purge	6/2/2019	CY			1
	6105623221	attacker	attacker	5/12/2019	2/18/2019			SE			1
	6394764087	attacker	attacker	5/5/2019	4/15/2019	purge	7/7/2019	CY			1
	6152974278	attacker	attacker	5/3/2019	2/28/2019	purge	6/3/2019	NL			1
	6353188228	attacker	attacker	5/12/2019	4/7/2019			CY			1
	5974715003	attacker	attacker	5/12/2019	1/24/2019			NL			1
	6096293436	attacker	attacker	5/12/2019	2/17/2019			SE			1
	6153573186	attacker	attacker	5/8/2019	2/28/2019	purge	7/9/2019	ID			1
	6111174567	attacker	attacker	5/11/2019	2/19/2019			NL			1
	6371123810	attacker	attacker	5/9/2019	4/10/2019			CY			1
	6261706711	attacker	attacker	5/11/2019	3/20/2019			SE			1
	6326040444	attacker	attacker	5/11/2019	4/2/2019			CY			1
	6328452740	attacker	attacker	5/11/2019	4/2/2019			CY			1
	6368267588	attacker	attacker	5/10/2019	4/10/2019			CY			1
	6108203369	attacker	attacker	5/6/2019	2/19/2019	purge	6/6/2019	NL			1
	6476845603	attacker	attacker	5/2/2019	5/1/2019	purge	6/2/2019	CY			1
	6500911096	attacker	attacker	5/12/2019	5/5/2019			CY			1
	6029574962	attacker	attacker	5/10/2019	2/4/2019			NL			1
	6071275998	attacker	attacker	5/4/2019	2/12/2019	purge	6/3/2019	NL			1
	6369100390	attacker	attacker	5/10/2019	4/10/2019			CY			1
	6506415140	attacker	attacker	5/7/2019	5/6/2019	purge	6/6/2019	CY			1
	6466873266	attacker	attacker	5/11/2019	4/29/2019			CY			1
	6079841064	attacker	attacker	5/11/2019	2/13/2019			SE			1
	6205049002	attacker	attacker	5/5/2019	3/10/2019	purge	6/4/2019	CY			1
	6080011461	attacker	attacker	5/12/2019	2/13/2019			SE			1
	6504646455	attacker	attacker	5/7/2019	5/6/2019	purge	6/6/2019	CY			1
	6252258794	attacker	attacker	5/9/2019	3/19/2019			SE			1
	6513224559	attacker	attacker	5/8/2019	5/8/2019	purge	6/7/2019	CY			1
	6255422384	attacker	attacker	5/9/2019	3/19/2019			SE			1
	6475586409	attacker	attacker	5/10/2019	4/30/2019			CY			1
	6156905113	attacker	attacker	5/8/2019	2/28/2019	purge	7/9/2019	ID			1
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	6208790002	attacker	attacker	5/4/2019	3/10/2019	purge	6/3/2019	SE			1
	6400224506	attacker	attacker	5/12/2019	4/16/2019			SE			1
	6104008493	attacker	attacker	5/5/2019	2/18/2019	purge	6/4/2019	SE			1
	6114418429	attacker	attacker	5/10/2019	2/20/2019			NL			1
	6153215353	attacker	attacker	5/10/2019	2/28/2019			NL			1
	6261959812	attacker	attacker	5/11/2019	3/20/2019			SE			1
	5738500677	attacker	attacker	5/9/2019	12/12/2018			AT			1
	6477477878	attacker	attacker	5/1/2019	5/1/2019	purge	6/2/2019	CY			1

userid	wa_sk	account	account_type	last_active	registration	deletion_reason	deletion_time	current_country	transfer_dates	transfers	num_transfer
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	6032594369	attacker	attacker	5/9/2019	2/4/2019			CY			1
	6248385121	attacker	attacker	5/10/2019	3/18/2019			SE			1
	6101712833	attacker	attacker	5/12/2019	2/18/2019			SE			1
	6052236642	attacker	attacker	5/11/2019	2/8/2019			NL			1
	6299619093	attacker	attacker	4/30/2019	3/28/2019	purge	7/1/2019	CY			1
	6150781378	attacker	attacker	5/12/2019	2/27/2019			NL			1
	6147574643	attacker	attacker	5/9/2019	2/27/2019			CY			1
	6249134404	attacker	attacker	5/12/2019	3/18/2019			ID			1
	6080922666	attacker	attacker	5/12/2019	2/14/2019			NL			1
	6244335608	attacker	attacker	5/12/2019	3/17/2019			ID			1
	6474340973	attacker	attacker	5/10/2019	4/30/2019			CY			1
	6467887309	attacker	attacker	5/10/2019	4/29/2019			CY			1
	6156837889	attacker	attacker	5/8/2019	2/28/2019	purge	7/9/2019	ID			1
	6116352919	attacker	attacker	5/12/2019	2/20/2019			SE			1
	6204999327	attacker	attacker	5/11/2019	3/10/2019			SE			1
	5737158373	attacker	attacker	5/8/2019	12/11/2018			NL			1
	6328577949	attacker	attacker	5/10/2019	4/2/2019			CY			1
	6151201631	attacker	attacker	5/12/2019	2/27/2019			NL			1
	6392792360	attacker	attacker	5/5/2019	4/15/2019	purge	7/7/2019	CY			1