WHAT'S NEWS@HFSC

HOUSTON FORENSIC SCIENCE CENTER • OCTOBER 2020

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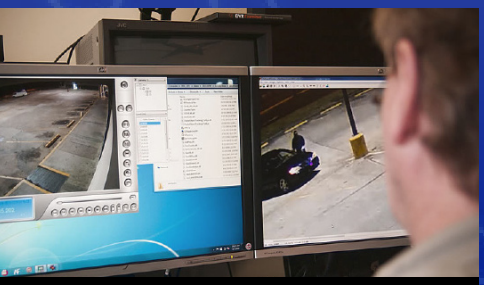


8 New software helps multimedia analysts extract phone data

HFSC's blind quality program celebrates 5-year anniversary and 2,000 blinds

By Callan Hundl

On September 3, 2015, two quality division staff members anxiously drove to the Houston Police Department property room, four blind DWI kits in tow. They patiently waited as property room personnel entered all the case information into the system.

Never could they have guessed that five years later those blinds would be the first of thousands and mark the beginning of a successful, unique quality program that the forensic community initially viewed with skepticism.

The program has helped identify areas for improvement in three disciplines and in an external vendor's manufacturing process.

HFSC began learning some of those lessons with the very first evidence drop when an analyst rejected one of those first four cases due to a discrepancy in the date of birth listed on the evidence. Embarrassing for the quality division but the first of many learning moments that has helped improve the program at every step.

Now, in September 2020, the blind QC program celebrated a significant birthday and some momentous accomplishments. The program has flourished and spans all sections, with the exception of crime scene. Quality division staff no longer wait patiently for the property room to enter cases into the database. The division has direct access to the database and HFSC's client services/case management (CS/CM) section drops blind evidence off at the property room like they do all other evidence.

On September 16, 2020, the quality division submitted its 2,000th blind QC. To date, almost 1,800 of those cases have been completed and less than four percent of blinds submitted have been discovered by analysts. Three cases have led to process improvements in the digital, seized drugs and latent print sections. The blind program also inadvertently discovered an area for improvement in the manufacturing process of the external vendor from which HFSC purchases blood vials for toxicology blinds. The blind program has also received national and international attention and accolades. It has been the subject of several peer-reviewed articles and a presentation topic at multiple conferences.

The quality division thanks the Houston Police Department, the Harris County Sheriff's Office unit that oversees the latent print database, CS/CM and all HFSC staff members that help make this program an enormous success. We could not maintain the program without their support.

Here's to five more years!

Peter Stout, Ph.D.

CEO/President

Dr. Peter Stout, HFSC's CEO and president, initially joined the agency in 2015 as its chief operating officer and vice president. He has more than 15 years of experience in forensic science and forensic toxicology. Prior to joining HFSC, Dr. Stout worked as a senior research forensic scientist and director of operations in the Center for Forensic Sciences at RTI International. Dr. Stout also has served as president of the Society of Forensic Toxicologists (SOFT). He represented SOFT in the Consortium of Forensic Science Organizations and has participated in national policy debates on the future of forensic sciences in the United States. Dr. Stout has a doctorate in toxicology from the University of Colorado Health Sciences Center in Denver. Dr. Stout also served as an officer in the U.S. Navy Medical Service Corps.

A Few Words From Our PRESIDENT

HOUSTON FORENSIC SCIENCE CENTER

The right answer at the right time.

If you've read this newsletter before or you have spent any time with HFSC, you have likely heard this phrase.

The real idea behind this motto of mine is to emphasize to staff and to stakeholders alike that a fast turnaround time only really works if the answer is right and vice versa. A right answer is useless if it arrives too late.

Most of this is pretty apparent from the phrase itself and most anyone who understands how a crime lab works and its relationship with stakeholders will intuitively grasp the meaning.

But what may not be clear from this statement is that often the right answer IS more important than the right time. And the right answer can take time.

So, what does this mean?

Since the wrong answer can have multiple, life-changing, negative consequences _ the worst of which is someone being wrongfully convicted for a crime and spending years in prison _ HFSC, like most crime laboratories, is laser focused on avoiding what we call a "false positive." In the real world, this means we can live with a certain number of "false negatives," which means missing the bad guy, but we must avoid ***at all costs*** an answer that would put an innocent person in jail. By doing this, the crime laboratory acts as a balance to law enforcement, which must by its very nature and mission, be less tolerant of the "false negative," meaning to get one bad guy off the street they can afford to make a few wrong arrests. This only works, though, if other parts of the justice system _ including the forensic laboratory _ are operating properly to counterbalance the first line of defense against crime.

However, this takes time. HFSC has multiple layers of review, protocol and standards it follows to guard against error, especially human error, which can never be completely eliminated but can be minimized.

The alternative might be cheaper and faster on the front end, but the long-term cost of one laboratory error can equal millions of dollars in damages paid to a person whose life has been ruined by one mistake. And there really is no dollar value we can attribute to a person and their family that has been the victim of such a travesty of justice.

After years of working closely with all parts of the justice system, it is clear to me we all genuinely want the same outcome and have the same goal: to bring justice and improve public safety.

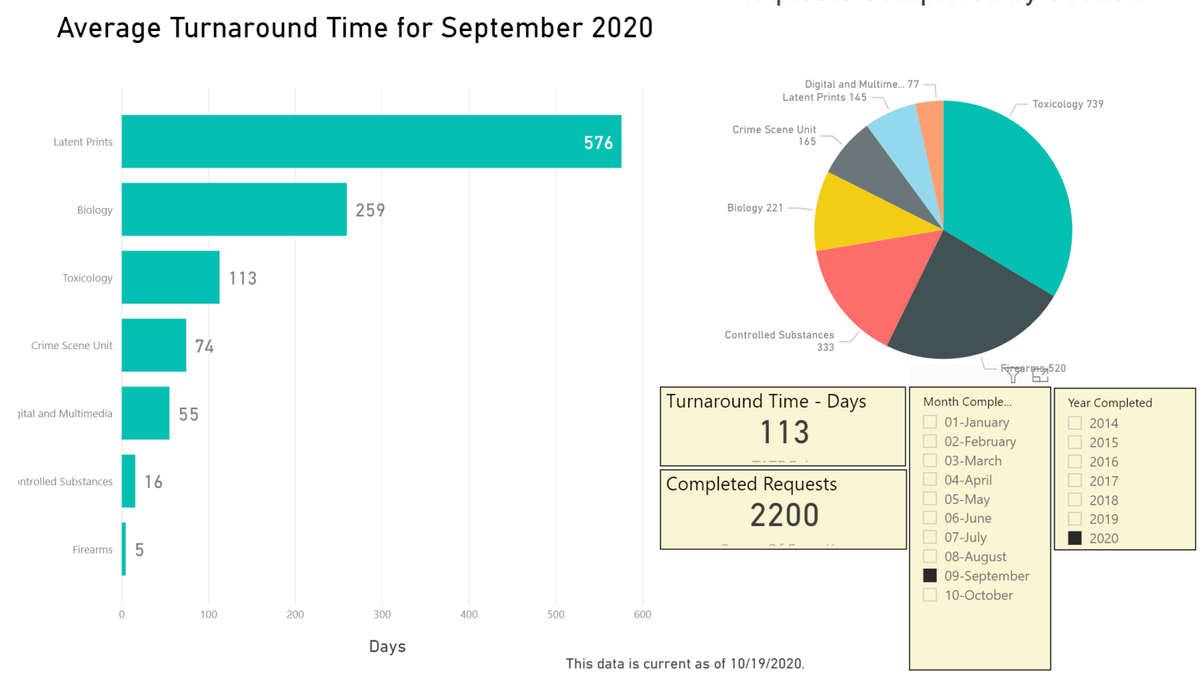
To do this effectively, we must all understand the role each of us plays.

For the crime laboratory it means we cannot take shortcuts to get a fast result. We must work with stakeholders and the community to think creatively and find the resources to get the RIGHT answer out faster.

Peter Stout, Ph.D.

CEO/President

HFSC At A Glance



Like most other essential services, HFSC has spent most of this year attempting to remain operational while also protecting staff and their family from being infected by the coronavirus. Most sections are operating on some form of a rotating schedule, juggling between the office and a remote work environment, to try to minimize physical interaction between people and ensure some distancing. There is no question, however, that this also impacts production right at a time when requests in some disciplines are increasing and the city is seeing a significant jump in violent crime.

At the same time, however, some areas are successfully making a dent in their backlogs. This is part of the reason for the above average turnaround time of 113 days. Because HFSC begins the clock ticking on a request from the moment it is made and stops the timer when a final report is released, turnaround time goes up as backlogs are eliminated. Most specifically, the toxicology section, which has a significant backlog, has been eliminating hundreds of cases per month. The latent print section has also been completing its oldest cases, artificially increasing that overall average turnaround time. And the forensic biology/DNA section is also working through its backlog. If you remove those two disciplines from the equation, the overall average turnaround time goes to about 22 days, which is a far more accurate reflection of when a final report is released in most sections. We expect this trend to continue as we work toward eliminating backlogs and getting back to our goal of having an overall average turnaround time of 30 days or less.

For more information, please visit www.houstonforensicscience.org

GUNS: FIREARMS IMAGING REQUESTS RISE

Requests are increasing for HFSC to enter into the national ballistic database images of fired cartridge casings from seized firearms. The reason for the increase remains unclear but it is occurring alongside a significant jump in homicides.

By Jordan Benton

The Houston Forensic Science Center's firearms section has seen more than a 6 percent increase in requests for ballistic imaging this year at the same time the city has struggled with a more than 35 percent jump in homicides.

It is unclear whether the increase in requests for service from the unit that handles the National Integrated Ballistics Information Network (NIBIN) is linked to the increase in homicides. However, the jump has occurred while the section also tries to rotate and flex schedules during the pandemic.

Despite the increase in requests and the pandemic struggles, the four-member NIBIN team usually releases results in a week or less.

The NIBIN technicians also completed shotgun training in September. HFSC will now also accept NIBIN requests for 12-gauge semiautomatic and pump-action shotguns, likely adding another 150 firearms to the workload annually.

Before moving to a new facility late last year, offering shotgun services was not even a possibility. But HFSC built a firing range in the new location that has made this possible.

NIBIN is a national database of images of fired cartridge casings from seized guns. The database is overseen by the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) and the images can help investigators link between a gun and a fired cartridge casing or link firearms between crimes.

Between January and September 2019, the unit averaged 323 requests per month. During the same time period this year, the group has received an average of 344 requests per month _ over a six percent increase.

Last year, the NIBIN team had an average overall turnaround time of nine days, but this year the average has been three days.

"The reduction in NIBIN turnaround time from 2019 to 2020 can largely be attributed to the unit eliminating its backlog in July 2019," said Donna Eudaley, manager of HFSC's firearms section.

"A backlog also accumulated during our move to 500 Jefferson, but now that it has been eliminated, we are processing firearms received for NIBIN typically in the same day," she added.

Three technicians come onsite daily to test fire seized guns and upload images into the database. Firearms examiners have been operating on rotating schedules _ alternating between one week onsite and one week working from home _ since March in an attempt to allow for distancing during the pandemic.

The NIBIN review process is paperless, so firearms examiners focus on administrative and technical reviews of NIBIN reports when they are working from home. All forensic reports

undergo two reviews before they are released.
Having dedicated reviewers has contributed to the drop in turnaround time.

"The NIBIN techs are exhausted, in part due to their determination to not let work sit until the next day," Ms. Eudaley said.

"The trend is that the number of guns being received overall is increasing, so we will continue to monitor how this will impact the team," she added.

Homicides rise

Crime Scene Unit struggles

The Houston Forensic Science Center's crime scene unit has been reeling from a triple whammy in 2020: a steadily increasing homicide rate, growing demand for them to respond to more crime types and a global pandemic.

The 28-member, 24/7 crime scene unit responds to all homicides, officer-involved shootings, death investigations and child deaths in the City of Houston's 685-mile-area. This year, homicides alone have increased more than 40 percent, making it even more difficult for the resource-strapped unit to respond to scenes. At the same time, the Houston Police Department is asking for CSU at aggravated assaults and other crimes, aware that their specialized, expert training in scene documentation and evidence collection could help the investigation.

For example, in September 2020, CSU responded to 30 aggravated assaults. In September 2019, the group responded to nine.

"I completely understand, and even agree with HPD, that CSU should respond to more scenes and a greater variety of crime types," said Jerry Pena, director of CSU and multimedia. "But with only 28 staff, something's got to give."

On Tuesday, six members of the team responded to the scene where a gunman shot and killed HPD Sgt. Harold Preston and wounded a second officer. This is the type of scene that requires the expertise, training and skill of a specialized, independent crime scene unit. It is also an incident that completely eats up all the available resources on a given day.

The reality is, CSU is now, more often, responding to multiple complex scenes, each of which demands and deserves focused, well-equipped, experienced professionals able to provide the justice system the essential evidence needed for a just outcome. But when 25% of the unit spends 20 hours at a complex scene only to turn around and respond to multiple homicides the next day, that mission is at risk.

"I am a true believer that all forensics begins in the field and that CSU should be the primary collector of evidence and scene documentation at nearly all crimes," said Dr. Peter Stout, HFSC's CEO and president. "But that's not possible with CSU's current size."

Really, to respond to Houston's needs, HFSC should have more than 100 CSIs, Dr. Stout said.

"Look at Chicago, a city with a slightly larger population with a far smaller geographic footprint. They have 200 CSIs. Even Dallas, which has about half the population of Houston, has about 100 CSIs," he added.

CSU's expansion is absolutely vital for Houston to properly respond to crime in the city and also to help ensure justice," Dr. Stout said.

Mr. Pena will present to HFSC's board of directors in November a five-year plan encompassing CSU resource and personnel needs.

Meanwhile, HFSC is using a combination of federal, city, HFSC and HPD funds to renovate the vehicle examination building. The downtown-area structure is used by CSU to process vehicles that may be associated with a crime. Until now, the facility had inadequate air conditioning and many of the vehicle bays were open, exposing the cars _ and the potential evidence on them _ to the elements.

The small budget allows HFSC to insulate and close existing bays, improve the air conditioning, upgrade security and update the bathroom, which flooded during Hurricane Harvey.

"Although the timing of the construction isn't great, we have to get this work done because we are getting more and more requests for vehicle examinations and we have to have a facility in place that not only allows our CSIs to work comfortably but also better preserves the evidence," Mr. Pena said.

The work should be complete in about six weeks. CSU is taking extra precautions to preserve evidence while the renovations are ongoing.

"We are looking forward to having a better facility to complete this important work," Mr. Pena added.

Looking to 2021

HFSC goals

The Houston Forensic Science Center is about to embark on the last year of goals in its three-year strategic plan, incorporating into the final set changes that account for lessons learned.

The three-year strategic plan, embraced in 2019 and incorporated into performance reviews to ensure all parts of the program are aligned, was designed to ensure the company's goals reflect a broader strategic outlook for not only production, but also employee satisfaction.

"It's no surprise that staff have really done amazingly well on these goals, but we have also learned a lot on this journey, not only about how to phrase the goals but also how to ensure they are achievable," said Dr. Amy Castillo, HFSC's COO and vice president.

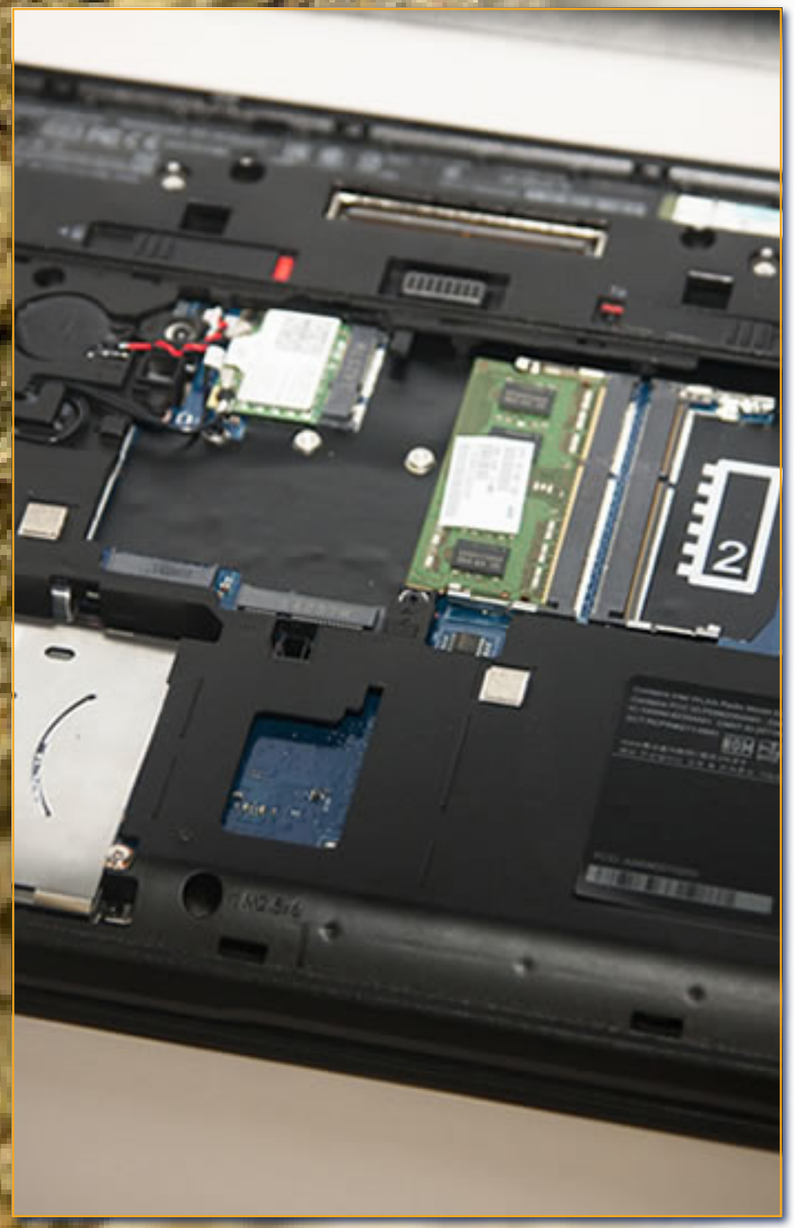
"The goals are designed to point all of HFSC in the same direction and I think we have a better idea how to both achieve that while also challenging staff to continue to strive for excellence," she added.

In 2020, HFSC scored 5 out of 5 on two goals and 4.5 on two others. The production goal, which called for a reduction in backlogs and turnaround times, came in at a two. It became clear as the year progressed that while some unexpected challenges made meeting the goal more difficult, it was actually not possible to achieve since turnaround times increase when backlogs decrease.

As a result, the production goal for next year has been changed to instead look at the age of the backlog and the analysis turnaround time. HFSC will continue to track and monitor overall turnaround times and share that information with stakeholders since it is the best measure of time from receipt to completion.

Multimedia "Hacking" phones

By Jordan Benton



The Houston Forensic Science Center's multimedia section has unlocked 16 Android mobile devices since April, a capability the team did not have until they rolled out a new software that helps "hack" phones that investigators submit in the hopes of retrieving information useful to their investigations.

The UFED Premium software also helped the multimedia analysts unlock another 33 iPhones, some of which may have remained out of reach before HFSC made the $150,000 a year investment in the software.

The software gives analysts enhanced capabilities as they try to unlock and extract information from mobile devices that have increasingly more sophisticated locking mechanisms.

The software is especially helpful because investigators do not often have the passcodes for the phones but need information, such as text messages and emails, that are on the device to assist in their investigations, usually homicides, sexual assaults and assaults.

"Nowadays, phones can be locked using numeric and alphanumeric codes, and even facial recognition and fingerprint identification," said Preston Coleman, a forensic analyst in HFSC's multimedia section.

Depending on the number and types of characters used in a passcode, the UFED Premium software can help obtain the information by going through an almost infinite number of possibilities during a 90-day period.

"When it comes to iPhones, the length and type of password will determine if the phone can be hacked. A four-digit passcode can usually be hacked within 90 days, sometimes a few weeks," Mr. Coleman said. "An iPhone with a six-digit passcode we work up to 90 days. After that duration, it could theoretically take years to access. When it comes to six-digit passcodes, if we can't access the device within 90 days, we won't be able to access the device."

Android phones can typically be hacked within a day or two using UFED Premium. Prior to HFSC purchasing the new software, some devices had to be shipped to the vendor to attempt to unlock the phone at a cost of several thousand dollars per item.

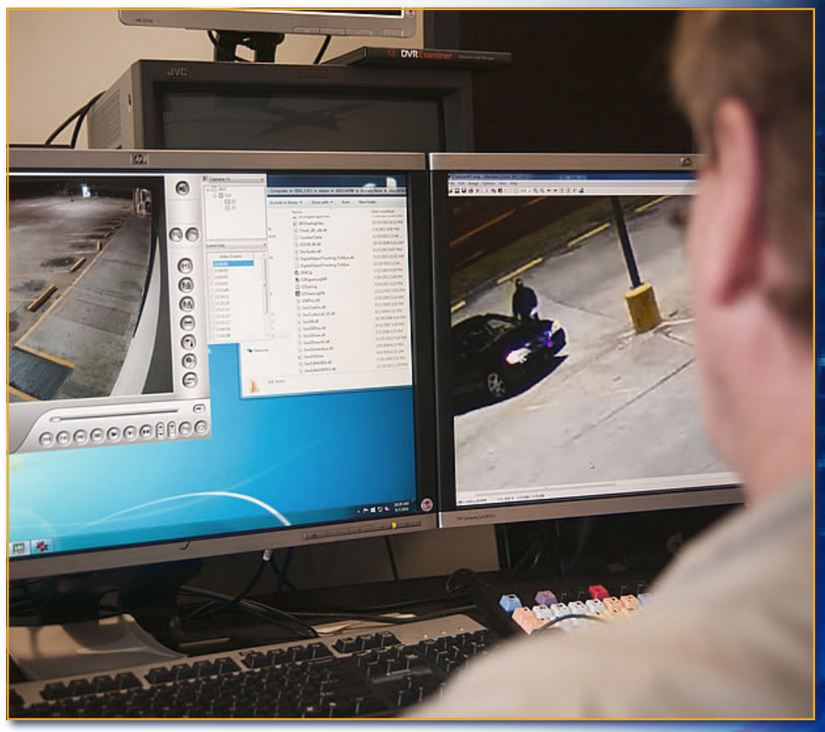
Since HFSC acquired the new software, requests for service have increased by 23 percent.

"We get more phones submitted into our section than any other device," Mr. Coleman said.

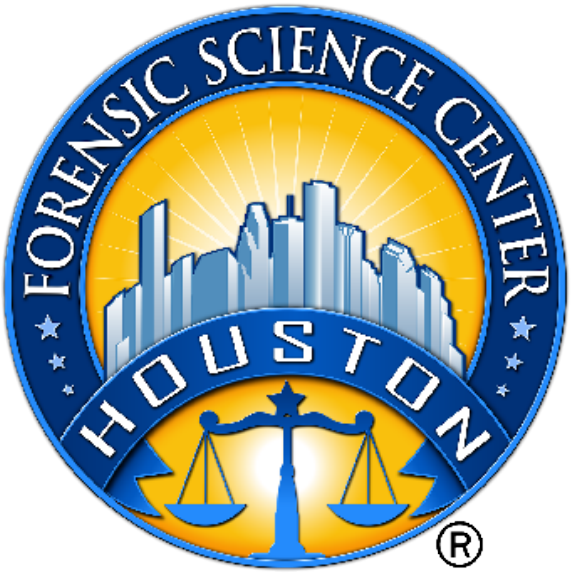
The nine-member section also analyzes laptops, tablets and other digital devices and does audio and video examination.

In September alone, investigators submitted 22 phones _ 12 iPhones and 10 Androids. The section unlocked six iPhones and two Androids. They were unable to unlock two iPhones and two Androids. Another seven phones were able to have information extracted from them successfully and did not require "brute force," or the need to hack, and three are in progress.

Currently, five analysts are authorized to work with phones and a sixth is in training. On average, analysts complete between four to six requests a month, but not all cases are created equal. Like other forensic disciplines, a single case can have multiple items of evidence, taking longer to complete. In response to the pandemic, the team is working on a rotating schedule that brings analysts onsite every other day. The section had an overall average turnaround time of 52 days in September.



The Houston Forensic Science Center's multimedia section is successfully extracting data from Android devices since purchasing a new $150,000/year software that is able to go through an almost infinite number of possibilities as it tries to crack the passcode of a given device. The new software has also helped the section obtain information from iPhones that may not have been breached before the software purchase. HFSC is the only agency in the region that has validated the software and is using it in casework. HFSC uses the software when it doesn't have the passcode information, which is frequent, and allows it to run for a maximum of 90 days. "If we can't access the device within 90 days, we won't be able to access the device," said Preston Coleman, a multimedia analyst.



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