

THREAT
ANALYSIS

CHINA

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The Role of US Technology in China's Public Security System



This report examines how public security entities in China acquire and use technology from companies based in the United States. The analysis draws heavily from Chinese government procurement records and industry exhibition documents, as well as other open-source materials. The report will be of most interest to researchers and activists who focus on human rights, policing, and technology, government agencies in the US and other countries that engage in export control or human rights work, and corporate personnel who carry out due diligence, corporate security, and compliance work. Information about the author, Zoe Haver, can be found at the end of this report.

Executive Summary

The public security system of the People's Republic of China regularly acquires and uses technology from companies in the United States. This system comprises the PRC Ministry of Public Security (MPS), the MPS' directly subordinate organizations, province-level public security departments, city-level public security bureaus, and the bulk of China's civilian police forces, among others. These entities engage in extensive state violence, including mass surveillance, the persecution of political and religious dissidents, and the mass detention of ethnic minorities, as documented by journalists, human rights researchers, and the US government. Public security entities in China also have a counterintelligence mission and carry out intelligence-related activities at home and abroad that target political threats to the Chinese Communist Party (CCP). As such, transfers of technology from US companies to Chinese public security entities risk facilitating state violence, intelligence, and counterintelligence in China, regardless of companies' intentions.

This report examines the role of US technology in China's public security system, with a focus on technology acquired via lawful commercial activity. First, we discuss the organization of China's public security system, review the state violence that it carries out, highlight its intelligence and counterintelligence activities, and examine US export control responses. Second, we analyze why Chinese public security entities value technology from US companies, highlighting unique capabilities and compatibility requirements as motivating factors. Third, we identify several key technology transfer pathways, namely industry exhibitions, third-party companies, local subsidiaries, acquisitions, and talent flows. Finally, we examine how public security entities use the US technology that they acquire, highlighting the Hainan Province Public Security Department's use of network and communications hardware from US companies and Xinjiang public security entities' use of hard drive disks from US companies.

Key Judgments

- Chinese public security entities almost certainly acquire and use technology from US companies that specialize in surveillance, network infrastructure, DNA analysis, aviation, countersurveillance, digital forensics, thermal imaging, criminal forensics, data storage, communications, optics, laboratory equipment, cybersecurity, explosives and narcotics detection, automobiles, and other areas.
- In some cases, public security entities in China almost certainly seek technology from US companies because foreign products outperform domestic equivalents. In other cases, these entities likely seek US technology to ensure compatibility with Chinese partner organizations that are already using products from a particular US company.
- For decades, numerous US companies and their representatives have used industry exhibitions, such as the China International Exhibition of Police Equipment, to directly market goods and services to Chinese public security entities.
- Third-party agents and distributors, like US-based Ryan Technologies, specialize in facilitating technology transfer and frequently act as intermediaries between US companies and public security end users in China.
- US companies, like Thermo Fisher Scientific, have established local subsidiaries in China that directly provide goods and services to Chinese public security clients.
- Chinese companies' acquisitions of US companies, such as Chongqing General Aviation Industry Group's acquisition of Enstrom Helicopter Corporation, have aided the growth of China's domestic industries and facilitated sales of US products to public security end users.
- Cross-border flows of talent likely function as a pathway for transfers of knowledge and technology to public security entities in China like the MPS Third Research Institute.
- The Hainan Province Public Security Department almost certainly uses network and communications hardware from IBM, H3C, Cisco, Comtech, and Motorola in numerous information systems, which may facilitate police intelligence, support the Golden Shield Project, carry out mass surveillance, and enable the command and control of public security forces, among other uses.
- Public security entities in the Xinjiang Uyghur Autonomous Region appear to have purchased at least 481 hard disk drives from Seagate and Western Digital in early-to-mid 2022, including surveillance-specialized drives and drives acquired alongside equipment from China's leading surveillance providers. Other entities in Xinjiang, such as prisons belonging to the paramilitary Xinjiang Production and Construction Corps, have also recently carried out surveillance-oriented purchases of Seagate or Western Digital hard disk drives.

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Figure 1: The MPS' headquarters at No. 14 Chang'an Road in Beijing (Source: Baidu Maps)

China's Public Security System

This section surveys the organization of China's public security system, highlights the forms of state violence that Chinese public security entities carry out, examines the intelligence and counterintelligence activities of public security entities, and discusses how the US has pursued export control measures in response to the state violence carried out by Chinese public security entities.

Organization of the Public Security System

The MPS is a central ministry under China's State Council.¹ It is responsible for leading and commanding public security work in China,² which explicitly includes protecting the political security of the CCP.³ Public security work includes predicting, stopping, and investigating criminal activity, defending against and striking at terrorist activity, maintaining social law and order, managing hukou⁴, resident identity card, citizenship, immigration and emigration, foreigner residency, and tourist affairs, and supervising security control work for public information networks.⁵ As part of this work, the MPS is also responsible for significant portions of China's ever-expanding mass surveillance system.⁶ Though the PRC Ministry of State Security (MSS) has absorbed much of the MPS' original foreign intelligence and counterintelligence responsibilities, the MPS still engages in some counterintelligence-oriented activities and continues to perform operations on foreign soil, such as clandestine operations targeting overseas dissidents, ethnic minority groups, religious organizations, and fugitives.⁷

The MPS oversees various bureaus, research institutes, universities, and other such organizations, covering a wide range of responsibilities.⁸ For a list of such bureau-level units directly subordinate to the MPS,⁹ see **Appendix A**. Under the MPS, provincial and autonomous region governments have public security departments (公安厅), city and county governments have public security bureaus (公安局), and lower levels of administration have institutions like public security sub-bureaus (安分局) and police stations (公安派出所).¹⁰ Local public security entities are relatively autonomous but still answer to the MPS.¹¹ The MPS and local public security entities are responsible for China's detention center (看守所) system,¹² which is distinct from the Ministry of Justice's (MOJ) prison (监狱) system.¹³

The MPS is responsible for the bulk of the People's Police (人民警察), China's civilian police force.¹⁴ The People's Police absorbed the former Public Security Border Defense Force (公安边防部队) and Public Security Guards Force (公安边警卫部队) in the late 2010s.¹⁵ The MPS previously had partial authority over the People's Armed Police (人民警察); as part of the aforementioned set of reforms, the PAP was reorganized and placed under the sole authority of the Central Military Commission.¹⁶ Likewise, the former Public Security Firefighting Force (公安消防部队) was transferred to the Ministry of Emergency Management.¹⁷ Other components of the People's Police fall under the MSS, MOJ, Supreme People's Court, and Supreme People's Procuratorate.¹⁸ The public security components of the People's Police swear loyalty to the CCP.¹⁹

Chinese Public Security Entities and State Violence

Public security entities in China have a well-documented track record of engaging in state violence. Researchers define state violence as “the use of legitimate governmental authority to cause unnecessary harm and suffering to groups, individuals, and states” with the goal of reaching “the organizational goals of a state or government agency”.²⁰ Examples of state violence include “human rights violations, crimes against humanity, war crimes, genocide, torture, prisoner abuse, and the oppression of racial, ethnic, gender, religious, or political minorities”.²¹ Several specific forms of state violence, as defined by various academic sources,²² that public security entities in China carry out are discussed in greater detail below.

China’s public security system is associated with a wide range of human rights violations and repressive activities. The 2021 annual report of the US Congressional-Executive Commission on China (CECC) alleges that public security entities in China detained computer coders for sharing the personal information of CCP General Secretary Xi Jinping’s relatives, detained critics of the CCP, denied activists access to lawyers, threatened the families of lawyers, extrajudicially detained activists, raided the homes of Christians, detained environmental advocates, and detained ethnic and religious minorities.²³ Likewise, the CECC’s 2020 annual report alleges that public security entities in China surveilled human rights lawyers, detained individuals who were working to archive investigative reporting that was critical of the Chinese government’s response to COVID-19, punished medical personnel for sharing information about the December 2019 outbreak of COVID-19, surveilled religious leaders, and detained artists critical of the Chinese government’s policies toward ethnic minorities.²⁴ The CECC also notes that, until December 2019, “public security officials were authorized to detain sex workers and their clients for six months to two years without judicial oversight” via the “custody and education” (收容教育) form of administrative detention, which “primarily targeted women” and was “prone to abuse”.²⁵ Transgender sex workers in China face particularly high levels of negligence, harassment, discrimination, and violence from the police.²⁶

Public security entities are also deeply involved in the implementation of mass surveillance across China, such as through the Golden Shield Project (金盾工程).²⁷ The first phase of this project, which the MPS launched in the late 1990s or early 2000s,²⁸ aimed to promote the “informatization”²⁹ (信息化) of China’s public security system and included numerous components. For example, it involved the creation of shared national public security information network infrastructure for use at each level of China’s public security system.³⁰ This phase also established 8 major national databases,³¹ such as the

National Population Basic Information Resource Database (全国人口基本信息资源库), which, combined with the project’s population information management system (人口信息管理系统), now allows public security personnel to quickly search and analyze the personally identifiable information of China’s entire population.³² Another component of the first phase was setting up public security identity authentication and access control management systems (公安身份认证和访问控制管理系统), which official sources describe as public key infrastructure/privilege management infrastructure platforms³³ (PKI/PMI平台) designed to promote system security and standardization.³⁴ The second phase of the Golden Shield Project emphasized goals like promoting “big intelligence” (大情报), improving applicability, and promoting information sharing.³⁵ Its components included the construction of intelligence information comprehensive application platforms³⁶ (情报信息综合应用平台) for use at each level of China’s public security system, as well as the construction of a national police geographic information system basic platform (全国警用地理信息基础平台; PGIS平台).³⁷ Other more recent programs that facilitate mass surveillance and that involve public security entities include the Skynet Project (天网工程), Sharp Eyes Project (雪亮工程), and the push to build smart cities (智慧城市).³⁸

Moreover, public security entities have been at the forefront of the mass detention and surveillance of the Uyghurs and other minority groups in China’s Xinjiang Uyghur Autonomous Region (XUAR).³⁹ As part of this campaign, local public security bureaus have been building a predictive policing capability called the Integrated Joint Operations Platform (IJOP; 一体化联合作战平台).⁴⁰ According to a 2019 Human Rights Watch (HRW) investigation into IJOP, the authorities in Xinjiang “are collecting massive amounts of personal information — from the color of a person’s car to their height down to the precise centimeter — and feeding it into the IJOP central system, linking that data to the person’s national identification card number”.⁴¹ After aggregating this data, the platform flags allegedly suspicious activity for the authorities, which includes benign behaviors such as “not socializing with neighbors”, having foreign ties, using WhatsApp, and “preaching the Quran without authorization”.⁴² HRW further notes that “some of those targeted [by IJOP] are detained and sent to political education camps and other facilities”,⁴³ which have reportedly held around 1 million people.⁴⁴ Recorded Future’s search of Xinjiang government procurement records uncovered documents mentioning IJOP as recently as December 2021, which suggests that the Xinjiang authorities are very much still using the platform.⁴⁵

12	喀什市一体化联合作战平台合并项目	三维人像综合数据门 I 型	59	套	12
		三维人像综合数据门 II 型	10	套	12
		综合数据门 III 型	820	套	12
		高空云台指挥系统 V1.0	10	套	12
		人脸比对预警系统 V1.0	300	套	12
		公安检查站综合安检系统 V1.0 (平台软件)	1	套	12
		公安检查站综合安检系统 (服务器)	20	套	12
		视频结构化处理系统	24	套	12
		治安卡口系统 (含车牌识别、人证合一)	222	套	12
		综合显控系统	10	套	12
		视频通信系统	10	套	12
		“人证合一” 核查设备	8	台	12
		X 光检测仪	26	台	12
		车底安全扫描系统	63	个	12
		遥控阻车路障	88	套	12
		车辆识别及管理系统	10	套	12
		UPS 不间断电源	10	套	12
		视频监控系統	10	套	12
		设备机房装修	10	套	12
		治安卡口系统 (非机动车道人车证合一)	380	套	12
业务中心	1	套	12		
便民警务站综合管理平台	1	套	12		

Figure 2: Description of IJOP components, such as a “facial comparison early warning system”, that was included in bidding documents for a Kashgar City Public Security Bureau (喀什市公安局) informatization maintenance and service project in late 2021 (Source: Kashgar City Public Security Bureau⁴⁶)

Intelligence and Counterintelligence Activities

Public security entities in China have a mandate to suppress perceived political enemies of the CCP and Chinese government, both at home and abroad. At the forefront of this effort are the secret police forces under the MPS Political Security Protection Bureau (公安部政治安全保卫局), known until recently as the MPS Domestic Security Protection Bureau (公安部国内安全保卫局),⁴⁷ which collects intelligence on and targets dissidents, religious groups, ethnic minorities, and fugitives within China’s borders and in other countries.⁴⁸ For instance, a local CCP committee website describes a city’s domestic (political) security protection *dadui* (大队)⁴⁹ as having a range of intelligence responsibilities related to social stability, political stability, and state security.⁵⁰ These include intelligence activities targeting “reactionary secret societies”, “illegal organizations”, “international terrorist groups”, “overseas hostile forces”, “criminal organizations masquerading as religious groups”, and “ethnic separatists”.⁵¹ Notably, the

website also explicitly states that the *dadui* is “responsible for overseas investigation and research work, [and] carrying out secret forces construction and various kinds of concealed professionalization and socialization construction”. Research has confirmed that political security protection forces under the MPS operate abroad, such as entering Myanmar to capture and repatriate fugitives.⁵² Recorded Future also observed the Guangxi Zhuang Autonomous Region Public Security Department seeking to re-lease servers in both Hong Kong and the US as part of a “domestic [political] security protection information system operational maintenance” contract in 2018, which provides further evidence of China’s political security protection forces operating abroad.⁵³

China’s public security system very likely continues to engage in certain counterintelligence-oriented activities despite the fact that the MSS has absorbed much of the MPS’ original counterintelligence responsibilities.⁵⁴ For instance, public security entities register and thereby track all foreigners traveling in China. Under the Exit and Entry Administration Law of the PRC, “Where foreigners stay in hotels in China, the hotels shall register their accommodation in accordance with the regulations on the public security administration of the hotel industry, and submit foreigners’ accommodation registration information to the public security organs in the places where the hotels are located”.⁵⁵ Additionally, it states that “for foreigners who reside or stay in domiciles other than hotels, they or the persons who accommodate them shall, within 24 hours after the foreigners’ arrival, go through the registration formalities with the public security organs in the places of residence”.⁵⁶ Likewise, in November 2021 journalists reported that the Henan Public Security Department had hired Neusoft Corporation (东软集团) to build a province-wide surveillance system to track foreign journalists, foreign students, and other “suspicious people” with the aim of protecting “national sovereignty, security, and interests”.⁵⁷

US Export Control Responses

In response to the state violence that Chinese public security entities carry out, particularly in Xinjiang, the US government has taken some steps in recent years to restrict the transfer of US technology to such entities. However, experts have questioned the efficacy of current US export control measures that target Chinese public security entities and the Chinese companies that support them.⁵⁸ The Export Control Reform Act of 2018, which appears to have been in part motivated by concerns about China,⁵⁹ defined dual-use items as including items with law enforcement-related applications and explicitly stated that US export control policy should serve to protect human rights.⁶⁰ Moreover, during 2019 and 2020, the US Department

of Commerce Bureau of Industry and Security (BIS) placed 21 Chinese public security entities (in addition to various Chinese companies) on the Entity List,⁶¹ which imposes export licensing restrictions on specific entities.⁶² These entities were placed on the Entity List due to their role in “human rights violations and abuses in the implementation of China’s campaign of repression, mass arbitrary detention, and high-technology surveillance against [Uyghurs], Kazakhs, and other members of Muslim minority groups in the XUAR”.⁶³ A full list of these 21 entities can be found in **Appendix B**. The Trump administration also signed the PROTECT Hong Kong Act in November 2019, prohibiting “the issuance of licenses to export covered munition items such as tear gas, rubber bullets, water cannons and other items” to the Hong Kong Police Force (HKPF).⁶⁴ The HKPF falls under the Hong Kong Security Bureau rather than mainland China’s public security system.⁶⁵ The exact extent of cooperation between the HKPF and Chinese public security entities is unclear, though both the MPS and MSS appear to have a relationship with the HKPF.⁶⁶

Moreover, many of the technologies described in this report very likely may not come within the ambit of existing US export controls.⁶⁷ As such, Recorded Future assesses that a large volume of technology transfers detailed in this report very likely are not subject to extensive export controls and may be freely sold without much oversight from the US government. However, technology transfers that are legal can still facilitate state violence, intelligence work, or counterintelligence activities, as certain subsequent sections of this report will demonstrate. Such transfers are currently receiving greater public and government scrutiny.

The Value of US Technology

China’s party-state has long promoted technology transfer to make up for domestic shortcomings and stimulate innovation.⁶⁸ The industries that serve China’s public security system have also participated in its drive to acquire, apply, learn from, and improve foreign technology.⁶⁹ China’s surveillance industry, for example, appears to rely on foreign hardware because “this is where Chinese companies still largely cannot provide their own substitutes and are thus heavily reliant in the West”.⁷⁰ Chinese surveillance companies rely on hard disk drives (HDDs) from US-based companies like Western Digital and Seagate, the latter of which has reportedly worked with Hangzhou Hikvision Digital Technology Co., Ltd. (杭州海康威视数字技术股份有限公司) to develop the world’s first surveillance hard drive,⁷¹ dispatched dedicated engineering teams to China to develop surveillance-oriented drives, and worked with Chinese surveillance companies as a strategic partner.⁷² Hikvision, which has been targeted by US export control measures,⁷³ has been extensively involved in

the mass surveillance and detention of the Uyghurs and other minority groups in Xinjiang,⁷⁴ and reporting shows the Xinjiang authorities use drives from both Western Digital and Seagate for surveillance.⁷⁵ Chinese surveillance companies also rely on graphics processing units (GPUs) from US-based companies like Intel and NVIDIA, with various US companies, including Intel, reportedly partnering with these Chinese surveillance companies to develop new surveillance capabilities.⁷⁶

As part of the procurement process, Chinese party-state entities sometimes provide expert assessments and other similar explanations to justify the purchase of specific foreign products, which collectively offer direct insight into why entities value US technology. In some cases, these internally oriented assessments clearly indicate that US products outperform equivalents from Chinese companies or otherwise offer unique capabilities. In other cases, these assessments reveal that Chinese public security entities likely seek out US products to ensure compatibility with partner organizations that are already using technology from a particular US company.

Outperforming Domestic Equivalents

Recorded Future observed numerous instances of Chinese public security entities describing US technologies as superior to their Chinese equivalents. For example, procurement records indicate that numerous Chinese public security entities have acquired and continue to use products from US-based video analysis provider Cognitech, Inc., with references appearing as early as February 2010 and as recently as November 2021.⁷⁷ A product brochure from a Chinese police and military equipment sales company claims that more than 80 public security entities in China use Cognitech, Inc.’s video “fuzzy image analysis processing system”, which appears to be the Chinese name for the company’s “Video Investigator” tool.⁷⁸ These entities include municipal public security bureaus, provincial public security departments and entities subordinate to these departments, academic institutions, and entities under the MPS.⁷⁹ We also observed evidence of third-party Chinese companies that claim to represent Cognitech, Inc. participating in Chinese policing industry exhibitions (see **Appendix D**).

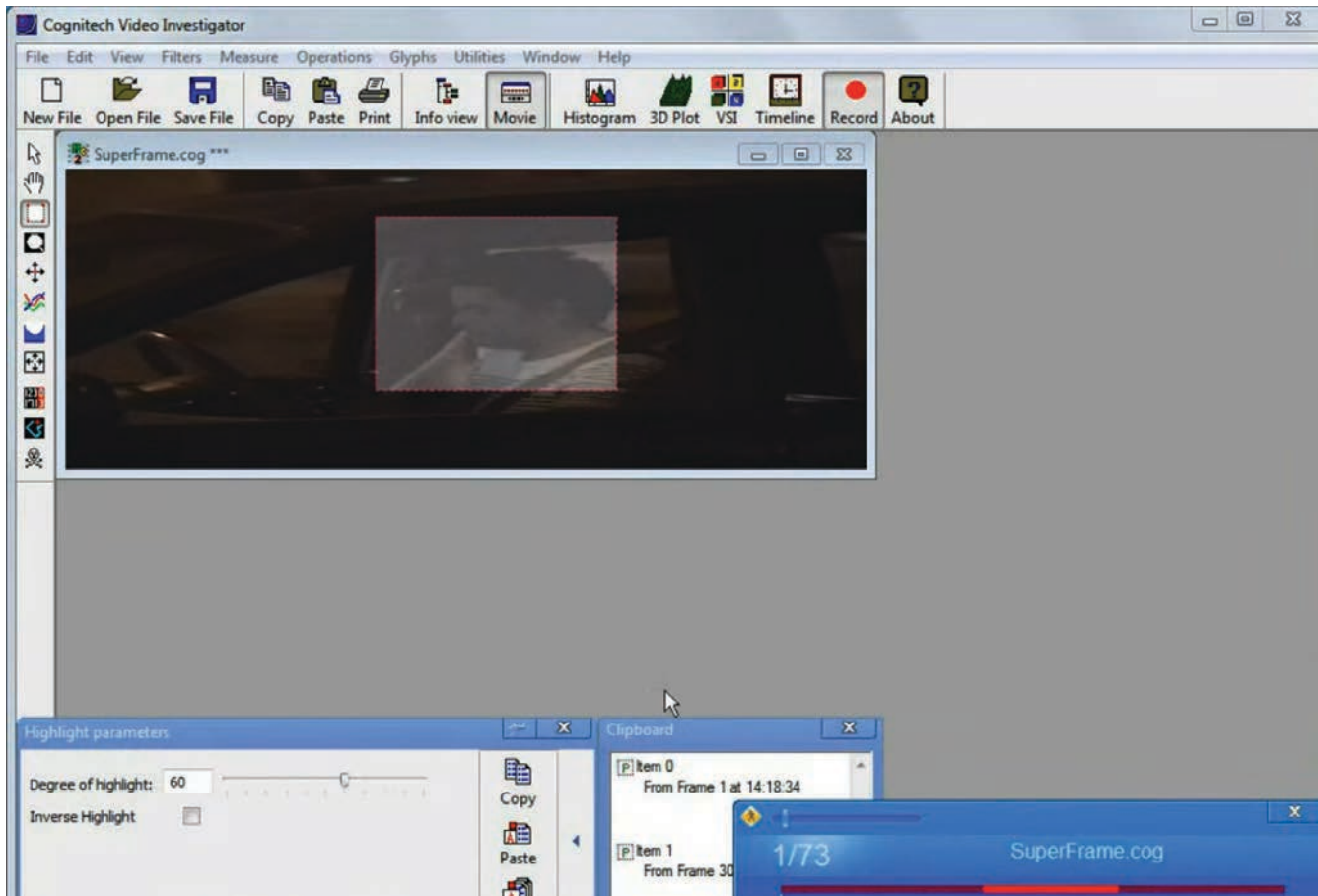


Figure 3: The user interface of Cognitech, Inc.'s Video Investigator tool (Source: Cognitech⁸⁰)

Cognitech, Inc. is headquartered in California, US.⁸¹ According to its website, the company “is a foremost developer of real-time image and video forensics processing and analysis software tools, 3D video photogrammetry software, lossless video acquisition cards, and integrated workstation systems for professional use by thousands of professional users in forensics, law enforcement, bio-identification, vehicle identification, intelligent CCTV systems ... geo-intelligence (GEOINTEL) and in surveillance fields”.⁸² Cognitech, Inc. states that its government agency customers include “Provincial Forensic Labs & Police Departments” in China as well as the Executive Office for United States Attorneys, the US Department Of Justice, US Department of Defense, US Department of Homeland Security, US Federal Bureau of Investigation, Japanese National Police Agency, and German Air Force.⁸³

A 2017 single source procurement document from the Tianjin City People’s Procuratorate⁸⁴ (天津市人民检察院) offers a detailed explanation of why law enforcement organizations in China value Cognitech, Inc.’s “video fuzzy image analysis processing system”.⁸⁵ The document states that, thanks to the progress of “public security informatization construction”, the quantity and

quality of video surveillance cameras in China have significantly increased.⁸⁶ It further explains that the expansion of video surveillance across China has driven a corresponding surge in demand for video image processing capabilities.⁸⁷ To meet this demand, the Tianjin City People’s Procuratorate was seeking to use a system from Cognitech, Inc.⁸⁸ The 2017 document makes 3 main arguments to justify the acquisition of a Cognitech, Inc. system via single source procurement:⁸⁹

1. The Cognitech, Inc. system has an original vector algorithm for complex moving images, 3-dimensional automatic measurement, and other capabilities that make it a true professional video fuzzy image analysis processing system.⁹⁰
2. The Cognitech, Inc. system has unique, world-leading patented technologies, and multiple countries have approved the system for practical and scientific use.⁹¹
3. The Cognitech, Inc. system’s “overall functions and quality cannot be replaced by other brands” and its “use effectiveness is obviously superior to other similar products”.⁹² As such, the system is widely used by public security entities across China, including the MPS Material

Evidence Evaluation Center (公安部物证鉴定中心), Criminal Investigation Police University of China (中国刑事警察学院), Beijing City Public Security Bureau Criminal Police Zongdui (北京市公安局刑警总队), and Guizhou Province Material Evidence Evaluation Center (贵州省物证鉴定中心).⁹³ In practice, the system has played an important role in the responses to major incidents such as the July 2009 protests and subsequent riots in Urumqi, Xinjiang.⁹⁴

To support the aforementioned arguments, the Tianjin City People's Procuratorate solicited expert opinions from senior engineers employed at the Criminal Investigation Police University of China, Shenzhen City Public Security Bureau Criminal Police Zhidui (深圳市公安局刑事警察支队), Guangdong Province Public Security Department Criminal Investigation Bureau Criminal Investigation Technology Management Center (广东省公安厅刑事侦查局刑事技术管理中心), and Jiangsu Yangzhou City Public Security Bureau Criminal Police Zhidui (江苏扬州市公安局刑警支队).⁹⁵ Each expert affirmed that Cognitech, Inc.'s system uses unique, world-leading patented technology and that the system is clearly superior to other similar products.⁹⁶ Recorded Future also observed the Changyi City Public Security Bureau (昌邑市公安局) in Shandong Province offering similar justifications for the purchase of the same Cognitech, Inc. system in 2016.⁹⁷

Beyond the case of Cognitech, Inc., Recorded Future identified other instances of Chinese public security entities providing detailed justifications for the purchase of foreign products that outperform domestic equivalents. Several examples include:

- Countersurveillance devices.** According to August 2021 procurement documents, the Nanning City Public Security Bureau SWAT Zhidui (南宁市公安局特警支队) in the Guangxi Zhuang Autonomous Region sought to obtain 2 nonlinear junction detectors from Research Electronics International,⁹⁸ which is based in the US.⁹⁹ According to Research Electronics International, its nonlinear junction detectors are "made to detect and locate hidden cameras, microphones, and other electronic devices" and have applications in technical surveillance countermeasures, countersurveillance, intelligence protection, and other similar areas.¹⁰⁰ The documents from the Nanning City Public Security Bureau SWAT Zhidui highlight the application areas of searching for explosive devices, protecting state secrets, and detecting illicit devices in detention centers.¹⁰¹ The documents describe the underperformance of domestic products and provide an expert assessment to justify importing the Research Electronics International

devices.¹⁰² Beyond Nanning City, we observed evidence of various city public security bureaus, provincial public security departments, and organizations directly subordinate to the MPS purchasing (or seeking purchase) Research Electronics International nonlinear junction detectors as well as other countersurveillance devices from the company, such as video pole cameras and telephone and line analyzers.¹⁰³

- Tactical equipment.** According to a July 2021 tender, the Jinhua City Public Security Bureau (金华市公安局) in Zhejiang Province was seeking to purchase an imported sniper rifle night vision device from L3Harris Technologies.¹⁰⁴ The document specifies that domestic night vision devices have been tested against foreign products and have consistently underperformed for a variety of reasons.¹⁰⁵ Likewise, according to a September 2020 tender, the Jinhua City Public Security Bureau was seeking to purchase nighttime combat devices from L3Harris Technologies, Steiner, 3M's PELTOR brand, and Vortex Optics. Like the July 2021 tender, the September 2020 tender sought to justify buying imported equipment on the basis of China's domestic equipment being inferior. L3Harris Technologies, 3M, and Vortex Optics are all US companies.¹⁰⁶ Steiner is headquartered in Germany,¹⁰⁷ but the tender document describes Steiner as a US company,¹⁰⁸ which suggests that the bureau was likely seeking equipment from a US entity of Steiner.¹⁰⁹
- Data center hardware.** According to a December 2016 procurement document, the Qinghai Province Public Security Department (青海省公安厅) aimed to purchase an unspecified imported "data center computer room specialized chilled water unit and UPS [uninterruptible power supply] host" as part of a network security data center computer room infrastructure project.¹¹⁰ The document further specifies that the chilled water unit must comply with strict European Union or US certifications.¹¹¹ The document claims that China currently lacks design and manufacturing standards or an industrial production licensing management system for such chilled water units, and that imported products outperform domestic equivalents.¹¹² Likewise, the document argues that domestic UPS servers are inferior to imported equivalents.¹¹³ As such, the Qinghai Province Public Security department sought to import hardware. The document also includes an assessment from 6 experts, who agreed that domestic products cannot meet the requirements of the network security data center computer room infrastructure project.

- Forensics devices.** According to a single source procurement announcement, the Xianju County Public Security Bureau (仙居县公安局) in Zhejiang Province was trying to acquire a “US Elephant Company ultraviolet observation camera system” in October 2015.¹¹⁴ According to the bureau, European and US ultraviolet observation systems use a safe wattage while domestic equivalents use an unsafe wattage that can cause harm to users.¹¹⁵ As such, the bureau hoped to import a US product.¹¹⁶ The aforementioned US Elephant Company is very likely Elephant Engineering, which was a division of US-based Syntronics, LLC.¹¹⁷ US-based General Atomics acquired Syntronics, LLC in 2017.¹¹⁸

Compatibility Requirements

Recorded Future also found that some Chinese public security entities likely seek US products for compatibility reasons. For example, procurement documents from late 2017 and early 2018 indicate that the Guangdong Province Public Security Department (广东省公安厅) purchased a US laboratory device so that its data would be compatible with national and local public security entities that use the same equipment. In a single source procurement announcement, the department states that the MPS Material Evidence Evaluation Center and some cities in Guangdong Province use the “Nuance EX” multispectral material evidence analysis system imported from the US, and that the MPS Material Evidence Evaluation Center had announced a project aimed at optimizing the system’s software and database.¹¹⁹ As such, the Guangdong Province Public Security Department appears to have worked through the supplier NBL Imaging System Ltd. (广州星博科仪有限公司; Guangzhou Xingbo Scientific Instruments Co., Ltd.) to acquire an imported “[Nuance] EX450-950” multispectral material evidence analysis system, which was almost certainly from US-based PerkinElmer,¹²⁰ so that its data would be compatible with the MPS and local cities.¹²¹



Figure 4: Nuance EX multispectral imaging system from PerkinElmer (Source: PerkinElmer¹²²)

Technology Transfer Pathways

This section analyzes several of the pathways through which China’s public security system acquires or could acquire technology from US companies, namely industry exhibitions, third-party companies, local subsidiaries, acquisitions, and talent flows. These technology transfer pathways are open to both technologies that can facilitate state violence (such as video surveillance products) and technologies that have more benign applications (such as breath alcohol analysis products). Some of the technologies that move through these pathways can support both unremarkable police activity and more questionable endeavors, such as DNA analysis devices and other laboratory equipment that can help solve crimes but also can help build population DNA databases. As such, a given transfer or transfer pathway cannot be judged to be benign or harmful without end-use context.

Industry Exhibitions

US companies have almost certainly marketed their products to Chinese public security entities at industry exhibitions since at least the early 2000s, including numerous US military and law enforcement contractors. We focused our analysis on the biennial China International Exhibition of Police Equipment (CIEPE; 中国国际警用装备博览会), which has been running for roughly 20 years and is hosted by the MPS.¹²³ Some state media reporting has described CIEPE as the only police equipment exhibition that the MPS hosts.¹²⁴ Chinese state media has also described CIEPE as “an important platform for promoting international policing exchanges and cooperation” and touted the participation of companies from the US.¹²⁵ According to a US exhibitor,¹²⁶ “CIEPE serves the growing market for public security equipment in China” and “many of the 20 thousand in attendance are decision makers” who are “looking for equipment and technology for their departments to order and purchase”.¹²⁷ Numerous companies from countries such as the United Kingdom (UK), Germany, France, Israel, Japan, and Italy have also participated in CIEPE over the years, though the activities of these companies are beyond the scope of this report.



Figure 5: Criminal investigation technology area at the 10th CIEPE in 2020 (Source: Xinhua¹²⁸)

Based on a review of publicly available exhibitor lists, we identified at least 52 likely instances of US-linked companies participating in CIEPE between the 2nd CIEPE in 2002 and the 10th CIEPE in 2020.¹²⁹ A list of US-linked exhibitors at CIEPE that we identified is included in **Appendix C**.¹³⁰ In some cases, the US-linked companies appear to have directly participated in the exhibition. In others, US-linked companies were identified as participants but were actually represented by third-party agents. The companies that we observed include US-based companies,

subsidiaries and joint ventures that US companies have established in China, and US companies that Chinese companies have acquired. A number of these companies have participated in multiple CIEPE events over the years. The companies specialize in areas such as video surveillance, thermal imaging, optics, aviation, biotechnology, explosives and narcotics detection, digital forensics, laboratory equipment, communications, edged weapons, cameras, lighting, automobiles, protective cases, and breath alcohol analysis. We also found US exhibitors that specialize in exporting technology to China from companies in the US and other foreign countries.

In addition to US companies selling their wares, we also observed third-party companies from China and Hong Kong marketing US policing technology at CIEPE as commercial agents. **Appendix D** includes 20 examples of self-described agent companies from the 5th CIEPE in 2010. At the 5th CIEPE, these 20 companies claimed to sell products from numerous US companies that specialize in areas like video surveillance, aviation, security inspection, counterterrorism, forensics, laboratory equipment, network infrastructure, optics, explosive ordnance disposal, tactical apparel and other gear, lighting, and cameras. Many of these agents' websites still list products from US and other foreign companies, indicating these activities continue as of mid-2022.

Third-Party Companies

US companies that develop policing technologies often do not bid directly on Chinese government contracts. Rather, third-party companies based in China, as well as some from Hong Kong and the US, play a significant intermediary role in funneling technology from US companies to public security end users in China. To illustrate the role of such distributors and agents, below we analyze the corporate network and activities of US-based Ryan Technologies. This network distributes technologies oriented toward digital forensics, DNA analysis, security inspections, countersurveillance, and other activities.

Ryan Technologies, also known as Ryan Security and Ryan Security Technology, describes itself as “the global leader in forensic, security, and law enforcement product distribution in China”.¹³¹ According to its website, Ryan Technologies was “founded in 1992” and is “operated out of Santa Barbara California”.¹³² The company has “tightly coupled itself with foreign based rep offices headquartered [sic] in Beijing and has consistently expanded its coverage opening 5 other offices in key cities including Shanghai, Guangzhou, Chengdu, Wuhan and Shenyang”, with additional maintenance stations “in over 30 other locations throughout China”.¹³³ Ryan Technologies has “sold and managed several technology transfer projects to China

We're proud to have long standing partners, many of which we've represented for many years. Below are just some of the partners and recognitions we have acquired. We are always looking for new opportunities and new partnerships. To learn more about partnering with us, [contact us now!](#)

EXPORT RECOGNITIONS

- Member of Forensic Science Association of China
- AccessData Elite Distributor Partner Status for 2012, 2013
- Foster Freeman – Best Performing Distributor 2010-2012
- Attestor – Best Performing Reseller 2011
- US Department of Commerce U.S. Commercial Service – Export Achievement Certificate
- Best Compliments from Management & Staff of Rapiscan Systems
- Morpho Detection Asia Pacific 2009-2010
- Security products and service provider of 2008 Olympic Games
- Commercial News USA – 2008 Expert of the Year

OUR PARTNERS INCLUDE



Figure 6: Partner information on Ryan Technologies' website (Source: Ryan Technologies¹³⁸)

handling all training, sales, installations, after sales support and more".¹³⁴ The company further claims that "the high level of communication between our Mandarin fluent US office and highly motivated Chinese staff gives our clients an unparalleled and transparent view into the market".¹³⁵ The company's "full fledged R&D team is capable of integrating products, developing add-on's/accessories [sic], and creating systems out of products to solve the problems our customers face".¹³⁶ Ryan Technologies states that "we also service most the [sic] products we sell regularly which allows us to monitor the use of the product long after the sale".¹³⁷ According to its website, Ryan Technologies uses the phone number "805-962-3080" and the company is

located at an address in Santa Barbara.¹³⁹ The company's addresses in China (as listed on its website) are provided in **Appendix E**. Ryan Technologies' website identifies numerous partner companies from the US and other countries and claims that the company has received a number of export recognitions, including 1 from the US Commercial Service of the US Department of Commerce.¹⁴⁰ The company has repeatedly participated in CIEPE (see **Appendix C**).

The corporate network of Ryan Technologies includes a number of companies, with each claiming to participate in the transfer of US technology to public security entities in China. Companies in this network include:

- **E.C. Ryan International.** Ryan Technologies is almost certainly legally registered in the US as E.C. Ryan International, Inc.¹⁴¹
- **Resonant.** At some point in the past several years, Ryan Technologies almost certainly rebranded as Resonant Ltd. (香港美耐特有限公司; Hong Kong Mei Nai Te Co., Ltd.).¹⁴²
- **Beijing Ryan Wende Science and Technology.** Ryan Technologies' Chinese headquarters is almost certainly Beijing Ryan [Ruiyuan] Wende Science and Technology Co., Ltd. (北京瑞源文德科技有限公司).¹⁴³
- **Beijing Ryan Huade Science and Technology.** Ryan Technologies' network in China almost certainly includes Beijing Ryan [Ruiyuan] Huade Science and Technology Co., Ltd. (北京瑞源华德科技有限公司).¹⁴⁴

Of the companies in Ryan Technologies' network, Beijing Ryan Wende Science and Technology Co., Ltd. is particularly notable. At the 5th CIEPE in 2010, Beijing Ryan Wende Science and Technology Co., Ltd. described itself as "Ryan Technologies (China), Ltd."; claimed to be "well known for being one of the most experienced service providers in the industry, and for offering integrated solutions for China's public security"; and claimed to specialize in "promoting and introducing western advanced IEDD/EOD [Improvised Explosive Device Disposal/Explosive Ordnance Disposal], anti-terrorism, public safety and forensic products to China".¹⁴⁵ The company claims to have over 40 products that have passed through MPS testing and certification.¹⁴⁶ On its website, the company states that it sells and services technology from companies in the US, Canada, the UK, Italy, Israel, and other foreign countries and lists foreign partners such as "MICROGEM PLC"; "Oxygen Forensic"; "Attestor Forensics GmbH"; "BlackBag Technologies, Inc"; "Elcomsoft"; "Logicube"; "Rapiscan Systems";¹⁴⁷ "Vidisco"; "FOCLAR", "Access Data"; "Med-Eng"; "DeltaPix"; "Foster + Freeman"; "L3 Technologies"; "REI" [Research Electronics International]; and "West Technology Systems Limited".¹⁴⁸ Some of these companies,¹⁴⁹ but not all of them, offer digital forensics products, which could be used to forcibly access the phones of protestors, activists, and other perceived enemies of the Chinese party-state.¹⁵⁰

Procurement records suggest that Beijing Ryan Wende Science and Technology Co., Ltd. has widely bid on Chinese public security contracts. We observed at least 144 Chinese government procurement records dated between August 2008 and March 2022 that reference Beijing Ryan Wende Science and Technology Co., Ltd., including 103 instances in which the company is identified as a successful bidder. In most instances, the company's clients are public security entities, though it

has also won contracts from entities such as procuratorates, courts, and airports.¹⁵¹ These procurement records show that the company serves clients across China at all levels of the public security system, including municipal public security bureaus, provincial public security departments, and organizations directly under the MPS.¹⁵² Given that the Ryan Technologies network specializes in selling foreign technology in the Chinese market, the majority of Beijing Ryan Wende Science and Technology Co., Ltd.'s public security contracts very likely involve the sale of technology from foreign companies. In certain instances, the documents that we reviewed explicitly name imported products, including products from US companies.¹⁵³ For instance, the Tianjin City Public Security Criminal Investigation Bureau¹⁵⁴ (天津市公安刑事侦查局) selected Beijing Ryan Wende Science and Technology Co., Ltd. to provide an IntegenX-brand RapidHIT¹⁵⁵ DNA analysis instrument from US-based Thermo Fisher Scientific in April 2015.¹⁵⁶

Local Subsidiaries

Some US companies have local subsidiaries in China that work directly with public security clients. A notable example of this is Invitrogen (Shanghai) Trading Co., Ltd. (英潍捷基(上海)贸易有限公司), a wholly-owned subsidiary of US-based Thermo Fisher Scientific.¹⁵⁷ Invitrogen (Shanghai) Trading Co., Ltd. appears to offer ongoing genetic analysis equipment maintenance services to Chinese public security entities.¹⁵⁸

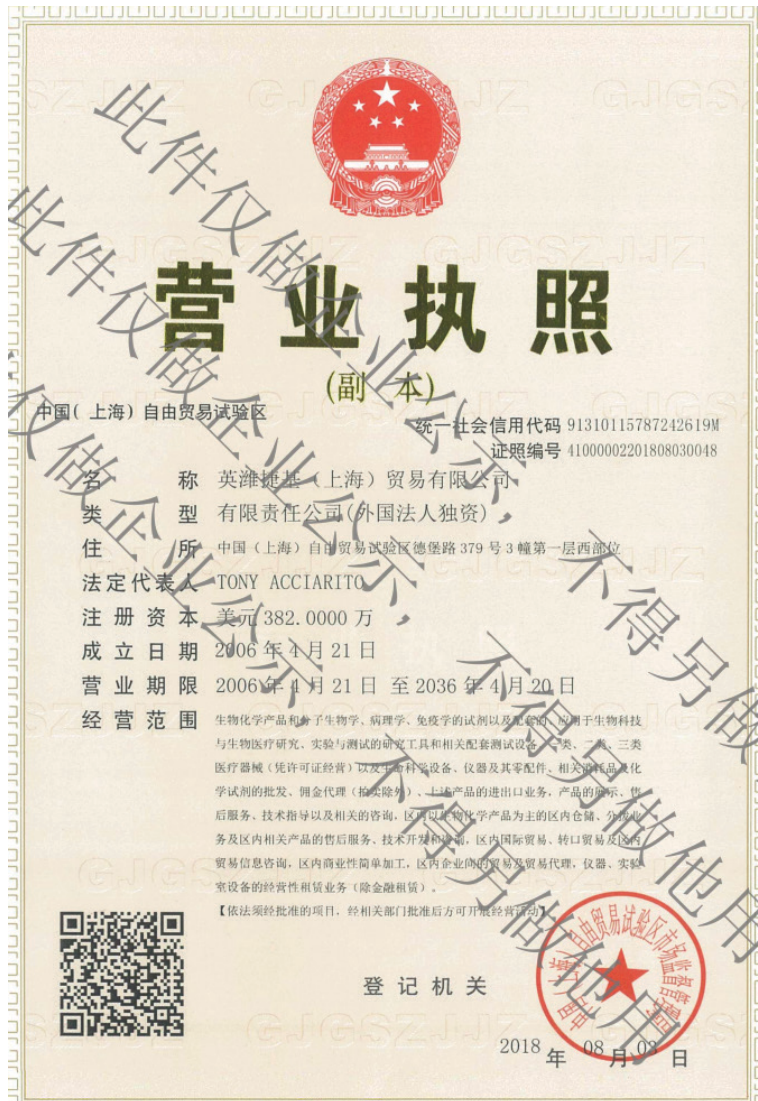


Figure 7: The copy of Invitrogen (Shanghai) Trading Co., Ltd.'s Chinese business license available on Thermo Fisher Scientific's website (Source: Thermo Fisher Scientific¹⁵⁹)

As “the world leader in serving science”, Thermo Fisher Scientific claims that it “delivers an unrivaled combination of innovative technologies, purchasing convenience and pharmaceutical services through our industry-leading brands, including Thermo Scientific, Applied Biosystems, Invitrogen, Fisher Scientific, Unity Lab Services, Patheon and PPD”.¹⁶⁰ In early 2019, journalists found that the Chinese authorities were using DNA equipment from Thermo Fisher Scientific as part of their mass surveillance campaign in Xinjiang.¹⁶¹ Though Thermo Fisher Scientific “said it would no longer sell its equipment in Xinjiang” in February 2019,¹⁶² reporting in mid-2021 revealed that “police in the Chinese region of Xinjiang are still buying hundreds of thousands of dollars’ worth of American DNA equipment despite warnings from the U.S. government that the sale of such technologies could be used to enable human rights abuses in

the region”, including equipment from Thermo Fisher Scientific.¹⁶³ Thermo Fisher Scientific has also repeatedly participated in CIEPE (see **Appendix C**).

Recorded Future observed at least 60 Chinese public security procurement documents dated between August 2013 and December 2021 that reference Invitrogen (Shanghai) Trading Co., Ltd., including 38 instances in which the company is identified as a successful bidder.¹⁶⁴ Many of these contracts are for maintenance services of Thermo Fisher Scientific equipment.¹⁶⁵ For example, the Fujian Province Public Security Department Criminal Investigation Technology Zongdui DNA Laboratory (福建省公安厅刑事技术总队DNA实验室) published a single-source tender announcement for a DNA information system maintenance project in September 2019.¹⁶⁶ This project included a sub-contract for “DNA Laboratory ABI [Applied Biosystems, Inc.¹⁶⁷] Equipment Maintenance Services”.¹⁶⁸ The document states that Applied Biosystems engineers provide DNA forensic equipment maintenance for the company’s products, and that no other organization has been entrusted to maintain these products.¹⁶⁹ As such, the sole company granted maintenance authority is Invitrogen (Shanghai) Trading Co., Ltd.¹⁷⁰ The document also mentions that the zongdui had purchased maintenance services for its “3130XL fluorescent sequencing instrument” from Invitrogen (Shanghai) Trading Co., Ltd. in 2015,¹⁷¹ very likely referring to Thermo Fisher Scientific’s 3130 Genetic Analyzer.¹⁷²

In other instances, Recorded Future observed Chinese public security entities acquiring Thermo Fisher Scientific products from Invitrogen (Shanghai) Trading Co., Ltd. via third-party companies, including in Xinjiang. For example, a pair of winning bid announcements from September 2020 show that the Urumqi City Public Security Bureau Criminal Investigation Zhidui (乌鲁木齐市公安局刑事侦查支队) had selected Xinjiang Kehua Hechang Biological Science and Technology Co., Ltd. (新疆科华和昶生物科技有限公司) to provide 2,732,480 RMB (\$420,000) worth of Thermo Fisher Scientific reagent kits and other consumable materials from Invitrogen (Shanghai) Trading Co., Ltd.¹⁷³

Acquisitions

The acquisition of US companies by Chinese firms can help facilitate the transfer of US technology to public security Chinese entities. A clear example of this process can be observed in state-owned Chongqing General Aviation Industry Group Co., Ltd.’s (重庆通用航空产业集团有限公司; 重庆通航集团; CGAG) acquisition of US-based Enstrom Helicopter Corporation,¹⁷⁴ which state media described in 2013 as the first time that a Chinese aviation enterprise had successfully purchased a well-known helicopter manufacturer from the US or Europe.¹⁷⁵ These helicopters are used in China for counterterrorism, riot control, reconnaissance,

and other missions.

According to its website, Enstrom Helicopter Corporation “designs and manufactures light, single-engine piston and turbine helicopters for commercial, government, and personal use”.¹⁷⁶ It is headquartered in Michigan, US.¹⁷⁷ Enstrom was reportedly one of the first Western helicopter brands to enter the Chinese market in the 1990s.¹⁷⁸ CGAG, previously known as Chongqing Helicopter Industry Investment Co., Ltd. (重庆直升机产业投资有限公司), acquired Enstrom Helicopter Corporation in 2012 and is an authorized dealer for Enstrom Helicopter Corporation in China.¹⁷⁹ Corporate records show that CGAG has multiple shareholders and that state-owned enterprises are its largest shareholders.¹⁸⁰ Documents from the 10th CIEPE also indicate that CGAG is state-owned,¹⁸¹ and Chinese state media has described it as a state-owned enterprise.¹⁸²

After CGAG acquired Enstrom Helicopter Corporation, industry media reported that “Enstrom is positioning itself for global expansion into emerging markets — with a bull’s eye squarely centered on China”.¹⁸³ The reporting stated that “CGAG is currently pursuing a production certificate from the Civil Aviation Administration of China (CAAC) to build Enstrom variants in country” and “while the certification process runs its course, Enstrom is shipping kits from Menominee [Enstrom’s US headquarters] to CGAG in China”.¹⁸⁴ Enstrom’s then-CEO asserted that CGAG “was tasked with finding a general aviation company ripe for purchase” and was “looking anywhere and everywhere to purchase a company, but of course, there were very few on the market then outside Enstrom”.¹⁸⁵ According to the reporting, “CGAG’s goal when they purchased Enstrom in 2012 was to increase production to 50 helicopters in Menominee with another 50 assemblies sent to China”.¹⁸⁶ A document from the Chongqing City Development and Reform Commission (重庆市发展和改革委员会) shows that CGAG likely had the capacity to produce at least 30 Enstrom helicopters a year in Chongqing by the end of 2014.¹⁸⁷

Chinese state media touted CGAG’s participation in the 10th CIEPE in 2020.¹⁸⁸ The coverage notes that CGAG demonstrated the capabilities of the police-model Enstrom 380B helicopter and other police equipment in areas like counterterrorism, anti-crime, emergency rescue, and guarding security.¹⁸⁹ It further claims that CGAG equipment supports the actual combat needs of public security forces, and that police aviation customers have unanimously recognized the company.¹⁹⁰ According to materials from the 10th CIEPE, CGAG is an “important platform” of the State Air Traffic Control Commission, National Development and Reform Commission, and CAAC for the development

of general aviation.¹⁹¹ The CIEPE materials claim that CGAG received a helicopter production license from CAAC, established the Chongqing Enstrom General Aviation Technology Research Institute (重庆恩斯特龙通用航空技术研究院), and established the Enstrom Helicopter Domestic Maintenance Center (恩斯特龙直升机国内维修中心). Moreover, the materials say that the company sells products like the Enstrom 480B and 280FX, and is developing products like the Enstrom TH180.¹⁹² The materials further state that the police-model Enstrom 480B helicopter is widely used in patrol, emergency rescue, counterterrorism, anti-drug, anti-smuggling, air command, and other police missions (very likely in China).¹⁹³ CGAG displayed the police-model Enstrom 480B helicopter at the 10th CIEPE.¹⁹⁴ Enstrom Helicopter Corporation or CGAG also participated in the 9th CIEPE in 2018 (see **Appendix C**).



Figure 8: CGAG booth at the 10th CIEPE in 2020 (Source: Xinhua¹⁹⁵)

Recorded Future did not observe any tenders from public security entities for the purchase of Enstrom helicopters from CGAG, though we did uncover a number of maintenance contracts that provide evidence of CGAG and its subsidiaries providing Enstrom helicopters to Chinese public security entities.¹⁹⁶ These documents are dated between October 2015 and April 2022, were issued by entities like the Guizhou Province Public Security Department (贵州省公安厅), Lanzhou City Public Security Bureau (兰州市公安局), and Chongqing City Public Security Bureau (重庆市公安局), and largely consist of single-source procurement announcements.¹⁹⁷ For instance, according to a March 2022 document from the Chongqing Public Security Bureau, the bureau purchased Enstrom 480B helicopters from CGAG in 2013 and in 2016.¹⁹⁸ The document further states that, due to the professional and technical requirements of helicopter maintenance, no company in China other than CGAG subsidiary Chongqing General Aviation Co., Ltd. (重庆通用航空有限公司)¹⁹⁹ is qualified to provide maintenance services for the

Enstrom helicopters, used for missions like counterterrorism, riot control, and reconnaissance.²⁰⁰ Likewise, a November 2018 document from the Guizhou Province Public Security Department indicates that the MPS donated Enstrom 480B helicopters to the department, that the MPS has a police aviation construction and development cooperation agreement with CGAG, that the MPS Police Aviation Management Office (公安部警用航空管理办公室) has a strategic cooperation framework agreement with CGAG, and that CGAG is uniquely qualified to provide long-term maintenance services from Enstrom 480B helicopters.²⁰¹ State media reporting shows that CGAG and the MPS Police Aviation Management Office signed their strategic cooperation agreement at a helicopter exhibition in September 2017.²⁰² As part of this agreement, CGAG reportedly agreed to provide 10 Enstrom 480B helicopters at a discounted price to support the development of China's police aviation industry and offer services in areas like personnel training and airport construction.²⁰³

Talent Flows

Cross-border talent flows are a pathway for knowledge and technology transfers from the US to China.²⁰⁴ Though such transfers can help facilitate state violence in China, Recorded Future emphasizes that Chinese nationals living, studying, and working abroad should not be assumed to be engaged in activities for the purpose of supporting state violence, espionage, or illegal activities, and deserve to live without the threats of xenophobia, ethnic profiling, and violence. We also note that foreign academics and universities are known to facilitate transfers of technology to China's public security system.²⁰⁵ In this section, we examine the career trajectories of several individuals who received educations from US universities or gained professional experience from US companies and then went to work for the MPS Third Research Institute (公安部第三研究所), a major research organization within China's public security system. To protect the privacy and safety of these individuals, we anonymize their personal identifiable information, their US alma maters, and their former US employers.

The Third Research Institute carries out scientific research and technical support activities related to smart policing and network security.²⁰⁶ It is based in Shanghai.²⁰⁷ The institute was founded in 1978 as the "Shanghai Public Security Science Research Institute" (上海公安科学研究所), was renamed to "MPS Public Security 876 Research Institute" (公安部上海八七六研究所) in 1979, and was then renamed once again to "MPS Third Research Institute" in 1984.²⁰⁸ The Third Research Institute claims to have made significant advances in the fields of "police information intelligent perception", "police data security sharing", and "illegal crime monitoring [and] early warning".²⁰⁹ It provides "core key technology support and systems solutions" in areas

like "network offense and defense, network reconnaissance, technical reconnaissance, domestic encryption, electronic evidence collection, classified protection, big data analysis, intelligent security, and drug testing".²¹⁰ It owns at least 6 companies, including Beijing Run Technologies Co., Ltd. (北京锐安科技有限公司),²¹¹ and oversees numerous departments, centers, and research laboratories.²¹² Procurement records from early 2022 reveal that Beijing Run Technologies Co., Ltd. sells open-source intelligence software that facilitates the collection and analysis of data from foreign sources across the clear web, deep web, and dark web, including Instagram, Facebook, LinkedIn, and other major social media platforms.²¹³



Figure 9: The MPS Third Research Institute's headquarters at No. 76 Yueyang Road in Shanghai (Source: Baidu Maps)

Recorded Future observed a number of instances of self-described current or former Third Research Institute employees claiming to have previously worked for foreign companies or claiming to have received degrees from foreign universities, including US companies and universities.²¹⁴ We highlight several examples below of such individuals who appear to have supported the Third Research Institute's work on cybersecurity and mass surveillance. In each of these cases, the individuals almost certainly leveraged their US educations or work experiences when employed at the Third Research Institute.

- Individual 1.** Individual 1 works on cybersecurity at the Third Research Institute, received a PhD from a US university, and has published numerous technical papers on cybersecurity and other topics.²¹⁵ Individual 1 was employed as an associate research fellow at the Third Research Institute since September 2018.²¹⁶ Previously, Individual 1 had been a postdoctoral researcher at the institute from May 2015 to September 2018. At the institute, Individual 1 reportedly works on "connected vehicle information security and privacy", and they previously worked on "privacy and network security".²¹⁷ Before joining the institute, Individual 1 was a research

assistant at a US university from September 2011 to February 2015.²¹⁸ The individual received a PhD in electrical, electronics, and communications engineering from the same US university in 2015.²¹⁹ Individual 1 has published nearly 30 conference papers, technical standards, and other publications related to subjects like network security, neural networks, unmanned aerial vehicles, and cyber threat intelligence.²²⁰

- Individual 2.** Individual 2 was employed at the Third Research Institute to work on subjects like computer vision and machine learning, has researched the use of neural networks in mass surveillance, and joined the Third Research Institute after receiving a master's degree from a US university.²²¹ Individual 2 was employed as a deep learning researcher at the Third Research Institute from August 2013 to November 2015.²²² At the institute, their responsibilities reportedly included working on precise image retrieval based on deep learning.²²³ Individual 2 received a master's degree in signal and image processing from a US university at an unspecified date.²²⁴ At this university, Individual 2 studied subjects such as digital image processing, digital video processing, pattern recognition, affine transformation, image segmentation, motion estimation, face recognition, and optical character recognition.²²⁵ Between September 2010 and June 2013, the individual worked for a laboratory that is very likely part of the aforementioned US university.²²⁶ At the US laboratory, this individual's responsibilities reportedly included working on facial recognition and researching context-based color image retrieval, among others.²²⁷
- Individual 3.** Individual 3 has been employed as a project manager at the Third Research Institute since September 2018.²²⁸ At the institute, the individual's responsibilities reportedly include designing and managing roadmaps based on trends in the cybersecurity industry, designing overall solutions for the cybersecurity of public security sensor networks, leading a cross-functional team to accomplish public security standard specifications, participating in national and ministerial cybersecurity research projects, managing product documents and answering bids, and providing regular trainings to customers and users on product portfolios and solutions.²²⁹ Before joining the institute, Individual 3 worked in the Shanghai offices of a US telecommunications company and a French-US

telecommunications company.²³⁰

Applications of US Technology

The technologies that public security entities in China acquire from US companies have a large number of possible applications. Previous sections of this report have already provided some details regarding how public security entities leverage products from US companies to facilitate activities such as surveillance video analysis, forensic analysis, police aviation, DNA analysis, countersurveillance, and SWAT operations. Our data on CIEPE participants (see **Appendix C** and **Appendix D**) further highlights potential applications of US technology in China's public security system, including thermal imaging, network infrastructure, digital forensics, communications, and many others. Moreover, numerous other studies and reports have detailed the support that foreign companies provide to China's public security system in the area of mass surveillance, where companies from the US and other countries have for decades aided the Chinese authorities' efforts to build a highly advanced surveillance state.²³¹

Over the course of our research, Recorded Future observed countless references to products from US companies in Chinese public security procurement documents. This technology is being used at every level of China's public security system across the country, including in particularly heavily surveilled jurisdictions like Xinjiang and Tibet.²³² This report would be hundreds of pages long if we named every US company, product, and Chinese public security end user that we identified via publicly accessible procurement documents. As such, we provide 2 case studies below that highlight several particularly notable application areas and end users. The first focuses on the Hainan Province Public Security Department's (海南省公安厅) use of network and communications hardware from US companies in its information systems, including in information systems that support mass surveillance and police intelligence. The second examines Xinjiang public security entities' continuing use of HDDs from US companies, including drives used for surveillance.

Case Study: Network and Communications Hardware in Hainan Province

The Hainan Province Public Security Department almost certainly uses a variety of products from US companies in its information systems. We observed evidence of this in bidding documents attached to annual information system maintenance tenders that the department published in late 2019, late 2020, and late 2021.²³³ These documents provide detailed descriptions of numerous information systems and lists of the hardware and software that the information systems currently use.²³⁴ The documents



Figure 10: The Hainan Province Public Security Department's headquarters at No. 9 Binya Road in Haikou (Source: Baidu Maps)

we limited our review to network and communications hardware. According to the documents, public security entities in Hainan are using hardware from these companies to facilitate their mission, including carrying out police intelligence, supporting the Golden Shield Project, carrying out mass surveillance, and enabling the command and control of public security forces. The documents also reveal other, more benign applications of this technology, such as the use of this hardware in the department's local area network (LAN) infrastructure.²³⁶ This case study therefore demonstrates how Chinese public security entities can leverage a given technology in multiple different ways.

The 2019, 2020, and 2021 documents from the Hainan Province Public Security Department identify network and communications hardware from various US-based or US-invested companies, including IBM, H3C, Cisco, Comtech, and Motorola.

- **IBM.** IBM is headquartered in New York, US, and provides products and solutions in areas like artificial intelligence, blockchain, business operations, cloud computing, data and analytics, hybrid cloud, information technology infrastructure, security, and supply chain.²³⁷

Previous research has found that China's public security system uses IBM products in various contexts, including mass surveillance.²³⁸

- **H3C.** H3C, also known as New H3C, is a joint venture between US-based Hewlett-Packard Enterprise (HPE) and China-based Unisplendour Corporation, with HPE holding a 49 percent stake and Unisplendor holding a 51 percent stake.²³⁹ Unisplendor is a subsidiary of Tsinghua Holdings, a state-owned enterprise.²⁴⁰ When Hewlett-Packard (HP), HPE's predecessor,²⁴¹ established H3C in 2015, it claimed that H3C would include "HP's China-based server, storage and technology services businesses" and that H3C would be "HP's exclusive provider of servers, storage and networking, as well as hardware support services in China".²⁴² According to HPE, "this structure enables HPE to participate in the fastest-growing IT market in the world, through HPE's sale of products to New H3C for resale in the China market".²⁴³ Previous reporting has found that Chinese law enforcement forces use H3C products, including in Xinjiang.²⁴⁴

- **Cisco.** Cisco is headquartered in California, US, and offers solutions in areas such as analytics and automation, artificial intelligence, cloud, collaboration, critical network infrastructure, intent-based networking, internet of things, networking, security, software, software-defined networking, smart buildings, and wireless mobility.²⁴⁵ Previous research and reporting has found that Chinese public security entities have long used Cisco products, including for mass surveillance.²⁴⁶
- **Comtech.** Comtech Telecommunications Corp. is based in New York, US, and offers products and solutions in areas like public safety and security as well as satellite and space communications.²⁴⁷ The Comtech products described in this section very likely come from a Comtech subsidiary, Comtech EF Data, which provides “high-performance satellite communications ground equipment” and is based in Arizona, US.²⁴⁸ Previous reporting has found that China’s maritime militia forces in the South China Sea are very likely using technology from Comtech EF Data.²⁴⁹
- **Motorola.** Motorola, Inc. split into Motorola Mobility and Motorola Solutions in 2011.²⁵⁰ Motorola Solutions is headquartered in Illinois, US, and is “a global leader in public safety and enterprise security” and offers solutions in “and mobile radio communications, video security & access control and command center software”.²⁵¹ Reporting has shown that Motorola has long supplied equipment to police in mainland China and Hong Kong,²⁵² and Recorded Future found that a Chinese subsidiary of Motorola has repeatedly participated in CIEPE (see **Appendix C**).

Alongside network and communications hardware from these companies, 1 of the projects discussed below also uses vehicles from Ford and Mercedes-Benz. Ford is a US company, and Mercedes-Benz is a German company. A joint venture that Ford established in China has reportedly participated in CIEPE (see **Appendix C**).

Intelligence Comprehensive Application Platform

According to the 2019 bidding documents, the Hainan Province Public Security Department QB²⁵³ Platform Optimization and Improvement Project (海南省公安厅 QB 平台优化完善项目), also known as the Intelligence Comprehensive Application Platform (情报综合应用平台), uses an unspecified server from IBM.²⁵⁴ Both the 2020 and the 2021 bidding documents reference the Intelligence Comprehensive Application Platform, but neither discusses any specific hardware.²⁵⁵ We assess that the IBM server is likely still in use.

According to the 2019 documents, the Hainan Province Public Security Department initiated the Intelligence Comprehensive Application Platform project in 2013.²⁵⁶ The project was likely implemented as part of the second phase of the Golden Shield Project.²⁵⁷ The platform’s capabilities include police intelligence dynamic monitoring and analysis, abnormal behavior monitoring, intelligent statistical analysis, key persons²⁵⁸ comparison early warning, key persons accumulated early warning, and data resources monitoring and management, among others. The platform has been fully applied in every city and county bureau across the province, serving as the basic system and work carrier for intelligence at the grassroots level.²⁵⁹ The 2020 bidding documents further specify that this platform was built in line with MPS big intelligence platform requirements, describing a ministry-province-city big intelligence work system that facilitates vertical and horizontal information sharing.²⁶⁰ This system was almost certainly developed as part of the Chinese authorities’ longstanding efforts to reform and improve intelligence work in policing.²⁶¹

（一）项目背景

1.1、海南省公安厅 QB 平台优化完善（软件）

根据公安部大情报平台建设与应用工作的统一部署，目前，海南省公安厅已经完成情报综合应用平台建设，创建了以重点人员动态管控、重大事件预警防范为核心，部省市三级情报平台纵向贯通、横向集成、高度共享、整体联动的大情报工作体系，实现了对省内重点人员动态分类管控。

当前，公安大情报平台在基层实战实效作用越来越明显，已经成为基层民警实战的必备工具。但随着大情报工作的不断推进与深化，情报综合应用平台数据资源不断增加，对海量数据的收集、整理、归类、分析，从复杂的数据中挖掘出各类数据背后所蕴含的内在的、必然的因果关系，找到隐秘的规律，促使这些数据从量变到质变，实现对海量数据的深度应用、综合应用和高端应用，使情报平台更加贴近基层一线实战。

Figure 11: Description of the Intelligence Comprehensive Application Platform from 2020 that highlights the platforms “key persons dynamic control” and “major incidents early warning and prevention” capabilities (Source: Hainan Province Public Security Department)

Public Security PKI/PMI Platform

According to the 2019 bidding documents, the Hainan Province Public Security Identify Authentication and Access Control Management System (海南省公安身份认证与访问控制管理系统), also known as the Hainan Province Public Security PKI/PMI Platform (海南省公安厅 PKI/PMI 平台), is a certificate authority (CA) authentication center that was built using public key cryptography.²⁶² The 2019 platform software and hardware product maintenance list identifies servers and network security switches from IBM, Cisco, and H3C.²⁶³ 2020 and 2021 bidding documents reference PKI/PMI the PKI/PMI platform specifically, but we assess that the system is likely still in use.²⁶⁴ The IBM, Cisco, and H3C components are listed in **Appendix F**.

According to the 2019 documents, this platform unifies the identity expression methods of public security information network users, authentication methods, and the authorization management modes, which promotes cross-department and cross-region secure information sharing.²⁶⁵ The construction of this local second-level PKI/PMI platform was completed during the first and second phases of the Golden Shield Project and

the platform’s PKI/PMI software, directory service software, application middleware, and certificate comprehensive suit query subsystem have been progressively upgraded.²⁶⁶ Hainan public security organs have issued over 20,000 digital certificates, which are connected to every major application area.²⁶⁷ The platform completes the basic security transformation of multiple application systems such as the police comprehensive [system], population information query system, and big intelligence system, which allows for basic authorized access control based on digital certificates via connection to the public security PKI/PMI system.²⁶⁸ As such, the PKI/PMI system platform constitutes the basic system and work carrier of grassroots civilian police informatized applications.²⁶⁹ The MPS has long identified such PKI/PMI platforms as an essential component of the Golden Shield Project.²⁷⁰

Public Security Video Monitoring and Checkpoint System

According to the 2019 and 2020 bidding documents, the Hainan Province Public Security Video Monitoring and Checkpoint System Project (Checkpoint Phase 1) (海南省公安视频监控和卡口系统项目 (卡口一期)) uses several H3C S1224 switches and came into use in 2014.²⁷¹ The 2021 documents do not reference the system, but we judge that it is likely still in use.²⁷² The system integrates numerous facial recognition and thermal imaging cameras, as well as human face analysis software, from Hikvision, thereby enabling port and train station surveillance.²⁷³

Public Security “Communications on the Move” Satellite Communications System

According to the 2019 bidding documents, the Hainan Province Public Security “Communications on the Move” (COTM) Satellite Communications System (海南省公安“动中通”卫星通信系统) includes components from Comtech, Motorola, Cisco, and H3C.²⁷⁴ The 2020 documents do not reference the COTM system.²⁷⁵ The 2021 bidding documents reference the same components. The components from Comtech, Motorola, Cisco, and H3C are listed in **Appendix F**. According to the 2019 documents, the system was built in 2009 and 2014. The system has 1 Ford COTM satellite vehicle and 1 Ford image acquisition vehicle with an accompanying satellite ground station.²⁷⁶ The system also has 1 Mercedes-Benz COTM satellite vehicle with 5 accompanying satellite ground stations.²⁷⁷ The Hainan Province Public Security “COTM” Satellite Communications system was built in accordance with MPS requirements, helps respond to emergency situations, and facilitates mobile command via real-time video and audio communications.²⁷⁸

Public Security Information Network Border Security Access Platform

According to the 2019 bidding documents, the Public Security Information Network Border Security Access Platform (公安信息网边界安全接入平台) uses servers, switches, and routers from H3C and IBM.²⁷⁹ The 2020 and 2021 documents include an identical list of components.²⁸⁰ The H3C components are listed in **Appendix F**. According to the 2019 documents, the platform was put into use in December 2010 and provides a secure channel for data exchanges, both within network and externally, and provides secure data support for all kinds of professional police work.²⁸¹ It has over 30 access services and has access links including a party-government-military link, an externally deployed public security link, and a social enterprise and institution link.²⁸²

Public Security Department Organs LAN H3C Network Equipment

According to the 2019 bidding documents, the LAN of the Hainan Province Public Security Department main office building comprises network equipment purchased from H3C in 2011.²⁸³ This equipment carries the internet of the department’s internal organizations and serves as a public security information backbone network.²⁸⁴ The 2019 maintenance service list associated with the Public Security Department Organs LAN H3C Network Equipment breaks the computer network systems into an “internet” section and a “public security network” section.²⁸⁵ The internet section comprises a pair of H3C S10500 switches and various other accompanying components.²⁸⁶ The public security network section identifies an identical pair of switches and accompanying components.²⁸⁷ The 2020 bidding documents identify the same equipment.²⁸⁸ The 2021 bidding documents do not mention these components, but we assess that they are likely still in use.²⁸⁹ The H3C components are listed in **Appendix F**.

Public Security Network Upgrade and Transformation (Video Transmission) Project

According to the 2019 bidding documents, the Public Security Network Upgrade and Transformation (Video Transmission) Project (公安网升级改造 (视频传输) 项目) uses switches, servers, routers, and other equipment from H3C.²⁹⁰ The 2019 hardware maintenance list confirms that the project uses a wide range of H3C components.²⁹¹ Most of the same components are also identified in the 2020 and 2021 bidding documents. The H3C components are listed in **Appendix F**. According to the 2019 documents, the project entered into use in July 2015. It involved procuring provincial public security department core switches, city and county convergence switches, provincial department LAN convergence switches, provincial department LAN access switches, network management platforms, routers, and servers.²⁹² The new equipment is used to carry key services and effectively guarantees the reliable operation of video private network equipment.²⁹³

Case Study: Hard Disk Drives in the Xinjiang Uyghur Autonomous Region

HDDs from Seagate and Western Digital are almost certainly being used by public security entities in Xinjiang, where the authorities have been carrying out a campaign of mass surveillance, mass detention, forced labor, forced sterilization, and other human rights violations targeting the Uyghur Muslims and other minority groups.²⁹⁴ Both companies are industry leaders in data storage and are based in California, US.²⁹⁵ In November

2019, journalists reported that Seagate and Western Digital sell drives to Chinese surveillance companies like Hikvision; that Seagate had long partnered with Chinese surveillance companies to develop new capabilities; that surveillance providers appear to rely on Seagate and Western Digital drives; that surveillance customers sometimes specifically request products from Seagate and Western Digital; and that these companies' drives are used in Xinjiang for surveillance.²⁹⁶ At the time, Seagate and Western Digital "said they comply with all laws and are closely watching Xinjiang", with Western Digital claiming that "we recognize the gravity of the allegations related to surveillance in the Xinjiang Province".²⁹⁷ Based on a review of recent XUAR government procurement records, Recorded Future judges that public security entities in Xinjiang are still widely using HDDs from Seagate and Western Digital as of mid-2022, including some for what appears to be surveillance activities.²⁹⁸ We also observed evidence of the paramilitary Xinjiang Production and Construction Corps (新疆生产建设兵团; XPCC) recently procuring Seagate and Western Digital drives for use in at least 2 of its prisons,²⁹⁹ both of which reportedly have held individuals detained as part of the mass detention campaign in Xinjiang.

Between January 1 and May 12, 2022, we observed at least 60 unique contract or winning bidding announcements from Xinjiang public security entities that reference Seagate drives.³⁰⁰ The documents were issued by 37 different public security entities, including city public security bureaus, city district sub-bureaus, county public security bureaus, and entities subordinate to the XUAR Public Security Department (新疆维吾尔自治区公安厅), among others.³⁰¹ According to the documents, these entities purchased at least 248 Seagate drives, including surveillance, network-attached storage (NAS), enterprise, computer, and portable drives.³⁰² Of the 32 surveillance drives that were purchased, 28 are from Seagate's SkyHawk series of surveillance-specialized storage HDDs.³⁰³ The SkyHawk series of products "leverages Seagate's extensive experience in designing drives purpose-built for surveillance applications" and their best fit applications include network video recorders (NVRs), embedded surveillance digital video recorders (DVRs), hybrid surveillance DVRs, and surveillance DVRs.³⁰⁴ These HDDs include "ImagePerfect firmware", which is "designed to ensure seamless video footage capture in 24x7 surveillance workloads that record video from 64 HD cameras".³⁰⁵ They also have "SkyHawk Health Management", which "actively helps protect your surveillance storage by focusing on prevention, intervention and recovery options".³⁰⁶ In several instances, XUAR public security entities, including entities that BIS has placed on the Entity List (see **Appendix B**), procured surveillance drives and other HDDs alongside surveillance equipment from leading Chinese surveillance providers like Hikvision, Zhejiang Dahua

Technology Co., Ltd. (浙江大华技术股份有限公司),³⁰⁷ and Zhejiang Uniview Technologies Co., Ltd. (浙江宇视科技有限公司).³⁰⁸ See **Appendix G** for more details regarding these surveillance-related purchases of Seagate drives.

Between January 1 and May 12, 2022, we observed at least 16 unique contract or winning bid announcements from Xinjiang public security entities that reference Western Digital drives.³⁰⁹ The documents were issued by 12 different public security entities, largely comprising city, county, and city district public security bureaus and sub-bureaus, with other end users being the Xinjiang Police College (新疆警察学院) and the public security bureau of an XPCC division.³¹⁰ According to the documents, these entities purchased at least 233 Western Digital HDDs and solid state drives, including data center, enterprise, computer, and portable drives.³¹¹ In 2 instances, XUAR public security entities procured Western Digital HDDs alongside surveillance equipment from Hikvision.³¹² See **Appendix G** for more details regarding these surveillance and intelligence-related purchases of Western Digital Drives.

In addition to public security entities' procurement of Seagate and Western Digital products, we also observed XPCC prisons acquiring drives from these companies for use in surveillance.³¹³ The XPCC was created in the 1950s using demobilized PLA units and placed under the authority of various party, state, and military entities.³¹⁴ The paramilitary organization "operates an administrative system with unified Party, government, military, and enterprise roles"; has "made strenuous efforts to fulfill faithfully the responsibilities the state has entrusted to it to cultivate and guard the border areas"; and now oversees a sprawling commercial empire.³¹⁵ According to the PRC authorities, the XPCC focuses on countering "separatist", "religious extremist", and "terrorist forces" in the XUAR, which "have become a major threat to national unity and to Xinjiang's social stability".³¹⁶ In recent years, the XPCC has actively participated in the surveillance and detention of the Uyghurs in Xinjiang and has profited from this repression campaign via forced labor.³¹⁷

Recorded Future observed at least 2 possible recent instances of XPCC prisons purchasing Seagate or Western Digital HDDs. In October 2021, the XPCC First Division Aral Prison (新疆生产建设兵团第一师阿拉尔监狱) announced the winning bidder for a "monitoring and control [surveillance] equipment" contract, which included 40 Seagate drives and various products from Dahua, such as 31 color infrared network hemisphere cameras.³¹⁸ Bidding documents associated with this contract show that the Seagate HDDs are surveillance-specialized drives.³¹⁹ The XPCC First Division Aral Prison reportedly holds victims of the Xinjiang mass detention campaign.³²⁰ In August 2021, the XPCC Third

Division Gemilik Prison (新疆生产建设兵团第三师盖米里克监狱) announced the winning bidder for a contract that, according to an attached product list, included 30 surveillance-specialized HDDs from either Seagate, Western Digital, or Japan-based Toshiba.³²¹ The announcement specifically mentions Seagate's ST8000DM004 computer drive, which suggests that the prison may have selected this drive over products from Western Digital or Toshiba.³²² The XPCC Third Division Gemilik Prison reportedly holds victims of the Xinjiang mass detention campaign.³²³

Outlook

Public security entities in China widely procure and use technology from companies in the US. In many cases, these entities likely leverage US technology to carry out relatively benign activities. However, Chinese public security entities also engage in significant levels of state violence and are tasked with intelligence and counterintelligence missions. As such, transfers of technology from US companies to Chinese public security end users risk inadvertently supporting state violence, intelligence work, and counterintelligence work in China. Without significant reforms to the US export control system or other government action, such transfers of technology to China's public security system will almost certainly continue unabated for the foreseeable future.

The transfer of policing technologies is not a problem unique to US companies. During the course of our research, we frequently observed Chinese public security entities procuring products from companies in the UK, Israel, Japan, Italy, Germany, Canada, Taiwan, and other countries. Moreover, cross-border flows of technology often go both ways. For instance, while US companies have reportedly sold surveillance technology (which has reportedly been used against US protesters) to public security entities in China,³²⁴ Chinese companies have reportedly provided surveillance capabilities to law enforcement entities in the US. Many US law enforcement entities reportedly use surveillance drones from the China-based DJI, which appears to be a leading law enforcement drone provider in the US,³²⁵ very likely for activities such as search and rescue operations, collision and crime scene documentation, and hazardous material incidents,³²⁶ as well as against US protesters in some instances.³²⁷ Likewise, US federal and local law enforcement entities have reportedly used surveillance cameras from Chinese providers like Hikvision and Dahua.³²⁸ As such, the behavior of US companies selling policing technology to China must be considered alongside the growth of the global surveillance industry, the international expansion of mass surveillance, and other similar trends.³²⁹

Appendix A: Bureau-Level Units Under the MPS

The MPS reportedly oversees numerous bureau-level units (局级单位). This appendix table lists the bureau-level units that a relatively comprehensive China Police Daily (人民公安报) article from May 2019 identified as being directly subordinate to the MPS.³³⁰ China Police Daily is the official paper of the MPS.³³¹ China Police Daily's list mainly contains MPS bureaus, though other entities are also named. The MPS website offers a similar, albeit less complete, list of organizations.³³² In several instances, the MPS shares authority over bureau-level units with other entities.³³³

Reported Bureau-Level Unit
MPS General Office (公安部办公厅)
MPS Intelligence Command Center (公安部情报指挥中心)
MPS Office of Research (公安部研究室)
MPS Supervision and Auditing Bureau (公安部督察审计局)
MPS Personnel and Training Bureau (公安部人事训练局)
MPS News and Propaganda Bureau (公安部新闻宣传局)
MPS Economic Crime Investigation Bureau (公安部经济犯罪侦查局)
MPS Law and Order Management Bureau (公安部治安管理局)
MPS Criminal Investigation Bureau (公安部刑事侦查局)
MPS Counterterrorism Bureau (公安部反恐怖局)
MPS Food and Drug Crime Investigation Bureau (公安部食品药品犯罪侦查局)
MPS SWAT Bureau (公安部特勤局)
MPS Railway Public Security Bureau (公安部铁路公安局)
MPS Network Security Protection Bureau (公安部网络安全保卫局)
MPS Prison Management Bureau (公安部监所管理局)
MPS Police Support Bureau (公安部警务保障局)
MPS Transportation Management Bureau (公安部交通管理局)
MPS Legal System Bureau (公安部法制局)
MPS International Cooperation Bureau (公安部国际合作局)
MPS Equipment and Finance Bureau (公安部装备财务局)
MPS Anti-Drug Bureau (公安部禁毒局)
MPS Science and Technology Informatization Bureau (公安部科技信息化局)
MPS Technical Investigation [or "Technical Reconnaissance"] Bureau (公安部技术侦察局)
MPS Retired Cadres Bureau (公安部离退休干部局)
MPS Material Evidence Evaluation Center (公安部物证鉴定中心)
MPS First Bureau (公安部一局) [very likely the MPS Political Security Protection Bureau (公安部政治安全保卫局)] ³³⁴
MPS Fourth Bureau (公安部四局) [likely the MPS Preventing and Dealing with Evil Cult Crimes Work Bureau (公安部防范和处理邪教犯罪工作局)] ³³⁵

Reported Bureau-Level Unit
Central Commission for Discipline Inspection MPS Discipline Inspection and Supervision Group (中央纪委国家监委驻公安部纪检监察组)
National Immigration Administration (国家移民管理局)
Civil Aviation Administration of China Public Security Bureau (中国民用航空局公安局)
General Administration of Customs Anti-Smuggling Bureau (海关总署缉私局)
MPS First Research Institute (公安部第一研究所)
MPS Third Research Institute (公安部第三研究所)
China People's Police University (中国人民警察大学)
Nanjing Forestry Police College (南京森林警察学院)
People's Public Security University of China (中国人民警察大学)
Railway Police College (铁道警察学院)
China Police Daily Group (人民公安报社)
China People's Public Security Press (中国人民公安出版社)
Golden Shield Film, Television, and Culture Center (金盾影视文化中心)

Table 1: Bureau-level units under the MPS (Source: China Police Daily)

Appendix B: Public Security Entities on the Entity List

According to data from the Federal Register, the Entity List currently contains 21 Chinese public security entities. These entities are listed in the appendix table below.

Entity	Date Added
Ministry of Public Security's Institute of Forensic Science of China (Forensic Identification Center of the Ministry of Public Security of the People's Republic of China; Material Identification Center of the Ministry of Public Security of the People's Republic of China)	June 2020
Aksu District Public Security Bureau (Aqsu District Public Security Bureau)	October 2019
Altay Municipality Public Security Bureau	October 2019
Bayingolin Mongolian Autonomous Prefecture Public Security Bureau	October 2019
Boertala Mongolian Autonomous Prefecture Public Security Bureau (Bortala Mongolian Autonomous Prefecture Public Security Bureau)	October 2019
Changji Hui Autonomous Prefecture Public Security Bureau	October 2019
Hami Municipality Public Security Bureau (Kumul Municipality Public Security Bureau; Qumul Municipality Public Security Bureau)	October 2019
Hetian Prefecture Public Security Bureau	October 2019
Kashgar Prefecture Public Security Bureau (Kashi Prefecture Public Security Bureau)	October 2019
Kelamayi Municipality Public Security Bureau (Karamay Municipality Public Security Bureau; Qaramay Municipality Public Security Bureau)	October 2019
Kezilesu Kyrgyz Autonomous Prefecture Public Security Bureau (Kizilsu Autonomous Prefecture Public Security Bureau)	October 2019
Shihezi Municipality Public Security Bureau	October 2019
Tacheng Prefecture Public Security Bureau	October 2019
Tumushuke Municipal Public Security Bureau (Tumxuk Municipal Public Security Bureau)	October 2019
Turfan Municipality Public Security Bureau (Turpan Municipality Public Security Bureau)	October 2019
Urumqi Municipal Public Security Bureau	October 2019
Wujiaqu Municipality Public Security Bureau	October 2019
Xinjiang Police College	October 2019
Xinjiang Production and Construction Corps (XPCC) Public Security Bureau	October 2019
Xinjiang Uyghur Autonomous Region (XUAR) People's Government Public Security Bureau	October 2019
Yili Kazakh Autonomous Prefecture Public Security Bureau (Ili Kazakh Autonomous Prefecture Public Security Bureau)	October 2019

Table 2: Public security entities on the Entity List (Source: Federal Register)

Appendix C: US-Linked Participants in CIEPE

Numerous US-linked companies appear to have participated in CIEPE. The non-exhaustive list of US-linked CIEPE participants in this appendix includes US-based companies, subsidiaries and joint ventures that US companies have established in China, and US companies that Chinese companies have acquired. All of the companies listed below have been identified as CIEPE participants, though some appear to have actually been represented by third-party agents.

Company	Description
10th CIEPE (2020) ³³⁶	
"FLIR DETECTION INC."	FLIR Detection is part of FLIR Systems, Inc. ³³⁷ FLIR Systems, Inc. is headquartered in Oregon, US. ³³⁸ The company "designs, develops, manufactures, markets, and distributes technologies that enhance perception and awareness" and brings "innovative sensing solutions into daily life through our thermal imaging, visible-light imaging, video analytics, measurement and diagnostic, and advanced threat detection systems". ³³⁹ Following an acquisition by California-based Teledyne Technologies Incorporated in 2021, it was rebranded as "Teledyne FLIR". ³⁴⁰
"Promega Corporation"	Promega Corporation is headquartered in Wisconsin, US, and is a "global biotechnology leader" with products used in the pharmaceutical and biotechnology industries, clinical and molecular diagnostics laboratories, forensics and paternity laboratories, government and academic research laboratories, and applied testing. ³⁴¹
"GUTH LABORATORIES.INC"	Guth Laboratories, Inc. "holds numerous US and foreign patents in the field of Breath Alcohol Analysis" and its "simulators and certified alcohol solutions are accepted as the standard of the industry worldwide". ³⁴² It is located in Pennsylvania, US. ³⁴³
"Tricol Biomedical, Inc"	Tricol Biomedical Inc. "is a leader in advanced acute wound care with products that provide rapid Hemorrhage Control (HemCon) of bleeding, protection of wounds, and promotion of normal healing" to "address the varying needs of patients and their healthcare professionals, military medics, paramedics, first responders, and consumers". ³⁴⁴ It is headquartered in Oregon, US. ³⁴⁵
"Daniel Winkler Knifemaker, LLC"	Daniel Winkler Knifemaker, LLC, also known as Winkler Knives, is located in North Carolina, US, and "is a limited production company that custom manufactures a diverse line of high performance edged tools" that "was established in response to requests from within the [Special Operations Forces] Community for specialized breaching tools and has become widely acclaimed for its no frills approach to tactical and rescue operation". ³⁴⁶
"SPORTSGEAR OUTDOOR PRODUCTS, LLC"	Sportsgear Outdoor Products, LLC, also known as Athlon Optics, is a company located in Kansas, US. ³⁴⁷ Athlon Optics is a "sports optics product company" that "works directly with Military, Law Enforcement, and other government agencies". ³⁴⁸
"Thermo Fisher Scientific"	Thermo Fisher Scientific "delivers an unrivaled combination of innovative technologies, purchasing convenience and pharmaceutical services through our industry-leading brands, including Thermo Scientific, Applied Biosystems, Invitrogen, Fisher Scientific, Unity Lab Services, Patheon and PPD". ³⁴⁹ Thermo Fisher Scientific is headquartered in Massachusetts, US. ³⁵⁰
"Pelican Products, Inc"	Pelican Products is headquartered in California, US, and is the "global leader in the design and manufacture of high-performance protective cases, temperature controlled packaging and advanced portable lighting systems", including for the military and law enforcement industries. ³⁵¹
"Abbott (ShangHai) Diagnostics Sales Co., Ltd."	Abbott (Shanghai) Diagnostics Sales Co., Ltd. appears to be a subsidiary of Abbott located in Shanghai, China. ³⁵² Abbott is "a global healthcare company devoted to improving life through the development of products and technologies that span the breadth of healthcare", including "diagnostics, medical devices, nutritionals and branded generic pharmaceuticals". ³⁵³ Abbott is headquartered in Illinois, US. ³⁵⁴

<p>“Ryan Technologies (北京瑞源文德科技有限公司)” [Beijing Ryan Wende Science and Technology Co., Ltd.]</p>	<p>Beijing Ryan Wende Science and Technology Co., Ltd. is part of the network of companies that have operated under names including Ryan Technologies,³⁵⁵ E.C. Ryan International Inc.,³⁵⁶ Beijing Ryan Wende Science and Technology Co., Ltd. (北京瑞源文德科技有限公司),³⁵⁷ Beijing Ryan Huade Science and Technology Co., Ltd. (北京瑞源华德科技有限公司),³⁵⁸ and Resonant Ltd. (香港美耐特有限公司).³⁵⁹ Resonant, previously known as Ryan Technologies, “is a value-add distributor of western public security and forensic technology to the People’s Republic of China” and “manages sales and distribution for its clients selling into China and offers product integration, localization, customer training and after-sale service”.³⁶⁰ Resonant is “operated out of Santa Barbara California”.³⁶¹</p>
<p>9th CIEPE (2018)³⁶²</p>	
<p>“Flir Systems,Inc.”</p>	<p>FLIR Systems, Inc. is headquartered in Oregon, US.³⁶³ The company “designs, develops, manufactures, markets, and distributes technologies that enhance perception and awareness” and brings “innovative sensing solutions into daily life through our thermal imaging, visible-light imaging, video analytics, measurement and diagnostic, and advanced threat detection systems”.³⁶⁴ Following an acquisition by California-based Teledyne Technologies Incorporated, it was rebranded as “Teledyne FLIR”.³⁶⁵</p>
<p>“美艾利尔（上海）医疗器械销售有限公司” [Alere (Shanghai) Medical Equipment Sales Co., Ltd.]</p>	<p>Alere (Shanghai) Medical Equipment Sales Co., Ltd. is a subsidiary of Alere Inc. located in Shanghai, China, that focuses on sales in the Chinese market.³⁶⁶ Alere Inc. is headquartered in Massachusetts, US, and is “is the global leader in point of care diagnostics”.³⁶⁷ Whether Alere (Shanghai) Medical Equipment Sales Co., Ltd. was rebranded after Abbott acquired Alere is unclear.³⁶⁸ Abbott is headquartered in Illinois, US.³⁶⁹</p>
<p>“美国派力肯产品有限公司” [US Pelican Products Co., Ltd.]</p>	<p>Pelican Products is headquartered in California, US, and is the “global leader in the design and manufacture of high-performance protective cases, temperature controlled packaging and advanced portable lighting systems”, including for the military and law enforcement industries.³⁷⁰</p>
<p>“赛默飞世尔科技（中国）有限公司” [Thermo Fisher Scientific (China) Co., Ltd.]</p>	<p>Thermo Fisher Scientific (China) Co., Ltd. is the China headquarters of Thermo Fisher Scientific and is located in Shanghai.³⁷¹ Thermo Fisher Scientific “delivers an unrivaled combination of innovative technologies, purchasing convenience and pharmaceutical services through our industry-leading brands, including Thermo Scientific, Applied Biosystems, Invitrogen, Fisher Scientific, Unity Lab Services, Patheon and PPD”.³⁷² Thermo Fisher Scientific is headquartered in Massachusetts, US.³⁷³</p>
<p>“北京瑞源文德科技有限公司” [Beijing Ryan Wende Science and Technology Co., Ltd.]</p>	<p>Beijing Ryan Wende Science and Technology Co., Ltd. is part of the network of companies that have operated under names including Ryan Technologies,³⁷⁴ E.C. Ryan International Inc.,³⁷⁵ Beijing Ryan Wende Science and Technology Co., Ltd. (北京瑞源文德科技有限公司),³⁷⁶ Beijing Ryan Huade Science and Technology Co., Ltd. (北京瑞源华德科技有限公司),³⁷⁷ and Resonant Ltd. (香港美耐特有限公司).³⁷⁸ Resonant, previously known as Ryan Technologies, “is a value-add distributor of western public security and forensic technology to the People’s Republic of China” and “manages sales and distribution for its clients selling into China and offers product integration, localization, customer training and after-sale service”.³⁷⁹ Resonant is “operated out of Santa Barbara California”.³⁸⁰</p>
<p>“ENSTROM HELICOPTER (重庆通用航空产业集团有限公司)” [Chongqing General Aviation Industry Group Co., Ltd.]</p>	<p>Enstrom Helicopter Corporation “designs and manufactures light, single-engine piston and turbine helicopters for commercial, government, and personal use”.³⁸¹ It is headquartered in Michigan, US.³⁸² Chongqing General Aviation Industry Group Co., Ltd. acquired Enstrom Helicopter Corporation in 2012 and is an authorized dealer for Enstrom Helicopter Corporation in China.³⁸³ Enstrom Helicopter Corporation announced bankruptcy in early 2022,³⁸⁴ though later reports indicate that its facilities would reopen as Enstrom Aerospace Industries under MidTex industries.³⁸⁵</p>
<p>“必达泰克光电科技（上海）有限公司” [B&W Tek Photoelectric Science and Technology (Shanghai) Co., Ltd.]</p>	<p>B&W Tek Photoelectric Science and Technology (Shanghai) Co., Ltd. appears to be a subsidiary of B&W Tek, Inc. that is located in China.³⁸⁶ B&W Tek is “the worldwide leader in Raman spectrometer manufacturing with over 10,000 Raman spectroscopy solutions delivered” and is headquartered in Delaware, US.³⁸⁷</p>

“长安福特汽车有限公司销售分公司” [Changan Ford Automobile Co., Ltd. Sales Branch Co.]	Changan Ford Automobile Co., Ltd. Sales Branch Co. appears to be part of Changan Ford Automobile Co., Ltd., an automobile manufacturing and sales joint venture between Ford Motor Co. and Changan Automotive Group that previously also involved Mazda Motor Corp. ³⁸⁸ Ford Motor Co. is headquartered in Michigan, US. ³⁸⁹
7th CIEPE (2014)³⁹⁰	
“Ryan Technologies”	Ryan Technologies is part of the network of companies that have operated under names including Ryan Technologies, ³⁹¹ E.C. Ryan International Inc., ³⁹² Beijing Ryan Wende Science and Technology Co., Ltd. (北京瑞源文德科技有限公司), ³⁹³ Beijing Ryan Huade Science and Technology Co., Ltd. (北京瑞源华德科技有限公司), ³⁹⁴ and Resonant Ltd. (香港美耐特有限公司). ³⁹⁵ Resonant, previously known as Ryan Technologies, “is a value-add distributor of western public security and forensic technology to the People’s Republic of China” and “manages sales and distribution for its clients selling into China and offers product integration, localization, customer training and after-sale service”. ³⁹⁶ Resonant is “operated out of Santa Barbara California”. ³⁹⁷
5th CIEPE (2010)³⁹⁸	
“Jupiter Systems (杰显通计算机系统)”	Jupiter systems “is the leading worldwide supplier of display wall processors for command and control applications”. ³⁹⁹ It is headquartered in California, US. ⁴⁰⁰
“Morpho Detection Inc.”	Morpho Detection Inc. is based out of California and is “one of the most experienced explosive & narcotic detection system manufacturers in the world”. ⁴⁰¹ Morpho Detection was “a subsidiary of SAFRAN and a partnership with General Electric Company” and was previously known as “GE [General Electric] Homeland Protection Inc.”; Safran, a French company, sold it to Smiths Group, a UK company, in 2017. ⁴⁰²
“Pelican Products China Representative Office (美国派力肯产品有限公司中国代理处)” [US Pelican Products Co., Ltd. China Representative Office]	Pelican Products is headquartered in California, US, and is the “global leader in the design and manufacture of high-performance protective cases, temperature controlled packaging and advanced portable lighting systems”, including for the military and law enforcement industries. ⁴⁰³
“Ryan Technologies (China), Ltd. (北京瑞源文德科技有限公司)” [Beijing Ryan Wende Science and Technology Co., Ltd.]	Ryan Technologies (China), Ltd. is part of the network of companies that have operated under names including Ryan Technologies, ⁴⁰⁴ E.C. Ryan International Inc., ⁴⁰⁵ Beijing Ryan Wende Science and Technology Co., Ltd. (北京瑞源文德科技有限公司), ⁴⁰⁶ Beijing Ryan Huade Science and Technology Co., Ltd. (北京瑞源华德科技有限公司), ⁴⁰⁷ and Resonant Ltd. (香港美耐特有限公司). ⁴⁰⁸ Resonant, previously known as Ryan Technologies, “is a value-add distributor of western public security and forensic technology to the People’s Republic of China” and “manages sales and distribution for its clients selling into China and offers product integration, localization, customer training and after-sale service”. ⁴⁰⁹ Resonant is “operated out of Santa Barbara California”. ⁴¹⁰
“Glocom(Shanghai) Company Limited (国路康通信技术(上海)有限公司) [Glocom Technology (Shanghai) Co., Ltd.]	Glocom (Shanghai) Company Limited appears to be a subsidiary of Glocom, Inc., which is headquartered in Maryland, US. ⁴¹¹ Glocom, Inc. “has provided leading edge design and manufacturing services as an Original Equipment Manufacturer (OEM) for major satellite and communications companies”. ⁴¹²
“Armor China Co., Ltd. (浙江美盾防护技术有限公司)” [Zhejiang Meidun Protection Technology Co., Ltd.]	Armor China Co., Ltd. appears to be a subsidiary of Armor USA Inc., ⁴¹³ which is located in Texas, US. ⁴¹⁴ Armor USA Inc. “is a leading manufacturer of bullet-resistant glass, forced-entry resistant glasses, and burglary-resistant windows for commercial and residential door and windows” and its products “are certified by Chinese Security Bureau, US Department of State, and Israeli MOSSAD”. ⁴¹⁵
“WeiBridge Networks Corporation (美国微桥视频科技有限公司)” [US Weibrige Video Science and Technology Co., Ltd.]	WeiBridge Networks Corporation “offers intelligent video surveillance solution [sic] with products including MPEG4/H.264 video encoders with built-in powerful video analytics, server based biometrics solutions and centralized network management system”. ⁴¹⁶ Its intelligent video surveillance systems “are designed to meet the growing demand to easily monitor and secure areas with security cameras”. ⁴¹⁷ The company is headquartered in Maryland, US, and has a sales office in Shanghai, China. ⁴¹⁸

<p>“L-3 Communications Security & Detection Systems (L-3通讯安全与探测系统公司) [L-3 Communications Security and Detection Systems Co.]”</p>	<p>L-3 Communications Security & Detection Systems was “the world’s leading supplier of security screening systems” designed to “safeguard the flow of commerce and defend critical infrastructure against terrorist threats”.⁴¹⁹ The company was part of L3 Communications, later known as L-3 Technologies and then L3Harris Technologies, from 2002 until L3Harris sold that part of the business to Leidos in 2020.⁴²⁰ L3Harris is a major US defense contractor headquartered in Florida, US;⁴²¹ Leidos is a major US defense contractor headquartered in Virginia, US.⁴²²</p>
<p>“3M CHINA LTD. (3M中国有限公司)” [3M China Co., Ltd.]”</p>	<p>3M China Ltd. appears to be a subsidiary of 3M located in China.⁴²³ 3M delivers “science-based performance and extraordinary outcomes across almost any industry you can imagine”, including the government and military industry.⁴²⁴ 3M is headquartered in Minnesota, US.⁴²⁵</p>
<p>“MOTOROLA CHINA (摩托罗拉(中国)电子有限公司企业移动解决方案-政府及公共安全业务) [Motorola (China) Electronic Co., Ltd. Enterprise Mobility Solutions Department - Government and Public Security Services]”</p>	<p>Motorola Inc. set up Motorola (China) Electronics Ltd. in Tianjin, China, in 1992 as part of its initial expansion into the Chinese market.⁴²⁶ Following Motorola Inc.’s split into Motorola Mobility and Motorola Solutions,⁴²⁷ Motorola (China) Electronics Ltd. appears to have remained under Motorola Solutions; it is now named “Motorola Solutions (China) Co., Ltd.”⁴²⁸ Motorola Solutions is “a global leader in public safety and enterprise security” and offers solutions in “and mobile radio communications, video security & access control and command center software”.⁴²⁹ Motorola Solutions is headquartered in Illinois, US.⁴³⁰</p>
<p>“AUTOCLEAR/Scintrex”</p>	<p>Autoclear LLC is located in New Jersey, US, and “specializes in the design, manufacture, and support of high quality, professional security X-ray scanners and metal detection systems, as well as advanced detection of trace particulate and vapor explosives and narcotics”.⁴³¹ Autoclear acquired Scintrex LLC, “a global supplier of some of the most sophisticated threat detection products in the industry”, in 2001.⁴³²</p>
<p>“EXCEL ENGINEERING, INC. (美国宇胜工程公司) [US Yusheng Engineering Co.]”</p>	<p>Excel Engineering, Inc. is located in Colorado, US, and “is mainly engaged in providing with [sic] state-of-the-art technology, measurement/control instruments, machinery and equipments [sic] made in the US, Canada and Europe”.⁴³³</p>
<p>“HONEYWELL CHINA CO, LTD. (霍尼韦尔(中国)有限公司)” [Honeywell (China) Co., Ltd]”</p>	<p>Honeywell (China) Co., Ltd. appears to be a subsidiary of Honeywell located in China.⁴³⁴ Honeywell is a “global leader in providing customers with high-performance specialty materials, including fluorocarbons, advanced fibers and composites, specialty additives and films, customized research chemicals, electronic materials and chemicals, and technology and materials for petrochemical refining”.⁴³⁵ Honeywell is headquartered in North Carolina, US.⁴³⁶</p>
<p>“Changan Ford Mazda Automobile Co., Ltd. (长安福特马自达汽车有限公司)”</p>	<p>Changan Ford Mazda Automobile Co., Ltd. was an automobile manufacturing and sales joint venture between Ford Motor Co., Mazda Motor Corp, and Changan Automotive Group.⁴³⁷ Changan Ford Mazda Automobile Co., Ltd. split into Changan Mazda Automobile Co., Ltd. and Changan Ford Automobile Co., Ltd. in 2012.⁴³⁸ Ford Motor Co. is headquartered in Michigan, US.⁴³⁹</p>
<p>4th CIEPE (2008)⁴⁴⁰</p>	
<p>“3m China Ltd.”</p>	<p>3M China Ltd. appears to be a subsidiary of 3M located in China.⁴⁴¹ 3M delivers “science-based performance and extraordinary outcomes across almost any industry you can imagine”, including the government and military industry.⁴⁴² 3M is headquartered in Minnesota, US.⁴⁴³</p>
<p>“Motorola (China) Electronics Ltd.”</p>	<p>Motorola Inc. set up Motorola (China) Electronics Ltd. in Tianjin, China, in 1992 as part of its initial expansion into the Chinese market.⁴⁴⁴ Following Motorola Inc.’s split into Motorola Mobility and Motorola Solutions,⁴⁴⁵ Motorola (China) Electronics Ltd. appears to have remained under Motorola Solutions; it is now named “Motorola Solutions (China) Co., Ltd.”⁴⁴⁶ Motorola Solutions is “a global leader in public safety and enterprise security” and offers solutions in “and mobile radio communications, video security & access control and command center software”.⁴⁴⁷ Motorola Solutions is headquartered in Illinois, US.⁴⁴⁸</p>
<p>“Shanghai General Motors Corporation Limited (上海通用汽车有限公司)”</p>	<p>Shanghai General Motors Corporation Limited, also known as SAIC-GM,⁴⁴⁹ is a “joint venture between [General Motors] and Shanghai Automotive Industry Corp. Group (SAIC)” that was formed in 1997 with General Motors holding a 50 percent stake.⁴⁵⁰ The company “builds, imports and sells a comprehensive range of Buick, Cadillac and Chevrolet products”.⁴⁵¹ General Motors is headquartered in Michigan, US.⁴⁵²</p>

<p>“Ryan Security Technologies, Ltd. (瑞源国际安全技术公司)” [Ryan International Security Technology Co.]</p>	<p>Ryan Security Technologies Ltd. is part of the network of companies that have operated under names including Ryan Technologies,⁴⁵³ E.C. Ryan International Inc.,⁴⁵⁴ Beijing Ryan Wende Science and Technology Co., Ltd. (北京瑞源文德科技有限公司),⁴⁵⁵ Beijing Ryan Huade Science and Technology Co., Ltd. (北京瑞源华德科技有限公司),⁴⁵⁶ and Resonant Ltd. (香港美耐特有限公司).⁴⁵⁷ Resonant, previously known as Ryan Technologies, “is a value-add distributor of western public security and forensic technology to the People’s Republic of China” and “manages sales and distribution for its clients selling into China and offers product integration, localization, customer training and after-sale service”.⁴⁵⁸ Resonant is “operated out of Santa Barbara California”.⁴⁵⁹</p>
<p>“Dupont Company (杜邦中国集团有限公司)” (DuPont China Holding Co., Ltd.)</p>	<p>DuPont Company China Holding Co., Ltd. appears to be a subsidiary of DuPont de Nemours, Inc., commonly known as DuPont.⁴⁶⁰ Dupont conducts business in the electronics and industrial, mobility and materials, and water and protection areas.⁴⁶¹ DuPont is headquartered in Delaware, US.⁴⁶²</p>
<p>“Flir System”</p>	<p>FLIR Systems, Inc. is headquartered in Oregon, US.⁴⁶³ The company “designs, develops, manufactures, markets, and distributes technologies that enhance perception and awareness” and brings “innovative sensing solutions into daily life through our thermal imaging, visible-light imaging, video analytics, measurement and diagnostic, and advanced threat detection systems”.⁴⁶⁴ Following an acquisition by California-based Teledyne Technologies Incorporated, it was rebranded as “Teledyne FLIR”.⁴⁶⁵</p>
<p>“Panoscan Inc.”</p>	<p>Panoscan Inc. “manufactures and markets ultra-high resolution, digital, panoramic camera systems and a handheld 3D scanner, with a variety of law enforcement applications” and is located in California, US.⁴⁶⁶</p>
<p>“Pelican Products (美国派力肯产品有限公司)” [US Pelican Products Co., Ltd.]</p>	<p>Pelican Products is headquartered in California, US, and is the “global leader in the design and manufacture of high-performance protective cases, temperature controlled packaging and advanced portable lighting systems”, including for the military and law enforcement industries.⁴⁶⁷</p>
<p>“Streamlight Inc.”</p>	<p>Streamlight Inc. “offers more market and user specific flashlights than any other professional lighting supplier” and “makes tools for everyone who needs to light the darkness - from homeowners to auto mechanics, industrial contractors to military personnel”.⁴⁶⁸ The company is located in Pennsylvania, US.⁴⁶⁹</p>
<p>3rd CIEPE (2006)⁴⁷⁰</p>	
<p>“Groen Brothers Aviation Inc. (格莱恩航空工业公司)” [Groen Aviation Industry Co.]</p>	<p>Groen Brothers Aviation, Inc. was located in Utah, US, and was “recognized as the world’s leading authority on autorotative flight”. The company “developed the world’s first commercially viable modern gyroplane”, which had applications “including aerial observation roles in both government and private applications, agricultural aerial application, tour guide flights, and cargo/passenger transport”.⁴⁷¹ It was a Defense Advanced Research Projects Agency (DARPA) contractor in the mid-2000s.⁴⁷² Groen Brothers Aviation Inc., was acquired by the newly registered Groen Aeronautics Corporation in 2012,⁴⁷³ and was later rebranded as Skyworks Global Inc.⁴⁷⁴ Skyworks is headquartered in California, US.⁴⁷⁵</p>
<p>“Guidance Software, Inc.”</p>	<p>Guidance Software makes “EnCase®, the gold standard in forensic security, that includes digital discovery solutions and endpoint information security” and is “court-proven solution for finding, decrypting, collecting and preserving forensic data from a wide variety of devices”.⁴⁷⁶ OpenText acquired Guidance Software in 2017.⁴⁷⁷ Guidance Software was headquartered in California, US, and OpenText is headquartered in Canada.⁴⁷⁸</p>
<p>“Honeywell Specialty Materials (霍尼韦尔特殊材料集团)”</p>	<p>Honeywell Specialty Materials is part of Honeywell.⁴⁷⁹ Honeywell is a “global leader in providing customers with high-performance specialty materials, including fluorocarbons, advanced fibers and composites, specialty additives and films, customized research chemicals, electronic materials and chemicals, and technology and materials for petrochemical refining”.⁴⁸⁰ Honeywell is headquartered in North Carolina, US.⁴⁸¹</p>
<p>“3M CHINA (中国有限公司)” [3M China Co., Ltd.]</p>	<p>3M China Ltd. appears to be a subsidiary of 3M located in China.⁴⁸² 3M delivers “science-based performance and extraordinary outcomes across almost any industry you can imagine”, including the government and military industry.⁴⁸³ 3M is headquartered in Minnesota, US.⁴⁸⁴</p>

<p>“W. L. Gore & Associates (戈尔 (香港) 有限公司)” [Gore (Hong Kong) Co., Ltd.]</p>	<p>W. L. Gore & Associates (Hong Kong) Ltd. appears to be a Hong Kong-based subsidiary of W. L. Gore & Associates.⁴⁸⁵ W. L. Gore & Associates uses “proprietary technologies with the versatile polymer polytetrafluoroethylene” for products with applications in the “medical, fabric, pharmaceutical and biotechnology, oil and gas, aerospace, automotive, mobile electronics, music and semiconductor industries”.⁴⁸⁶ The company is headquartered in Delaware, US.⁴⁸⁷</p>
<p>“Shanghai General Motors (上海通用汽车有限公司)”</p>	<p>Shanghai General Motors Corporation Limited, also known as SAIC-GM,⁴⁸⁸ is a “joint venture between [General Motors] and Shanghai Automotive Industry Corp. Group (SAIC)” that was formed in 1997 with General Motors holding a 50 percent stake.⁴⁸⁹ The company “builds, imports and sells a comprehensive range of Buick, Cadillac and Chevrolet products”.⁴⁹⁰ General Motors is headquartered in Michigan, US.⁴⁹¹</p>
<p>“Applied Biosystems (美国应用生物系统公司)” [US Applied Biosystems Co.]</p>	<p>Applied Biosystems provides genomics technology for use in areas like cancer research, complex disease research, population genomics, evolutionary and conservation biology, infectious disease research, rare and inherited disease research, and agronomics.⁴⁹² Invitrogen acquired Applied Biosystems in 2008, with the newly merged company being named Life Technologies Corporation.⁴⁹³ Thermo Fisher Scientific acquired Life Technologies Corporation in 2014.⁴⁹⁴ Thermo Fisher Scientific is headquartered in Massachusetts, US.⁴⁹⁵</p>
<p>“Ryan Security Technologies, Ltd. (瑞源国际安全技术公司)” [Ryan International Security Technology Co.]</p>	<p>Ryan Security Technologies Ltd. is part of the network of companies that have operated under names including Ryan Technologies,⁴⁹⁶ E.C. Ryan International Inc.,⁴⁹⁷ Beijing Ryan Wende Science and Technology Co., Ltd. (北京瑞源文德科技有限公司),⁴⁹⁸ Beijing Ryan Huade Science and Technology Co., Ltd. (北京瑞源华德科技有限公司),⁴⁹⁹ and Resonant Ltd. (香港美耐特有限公司).⁵⁰⁰ Resonant, previously known as Ryan Technologies, “is a value-add distributor of western public security and forensic technology to the People’s Republic of China” and “manages sales and distribution for its clients selling into China and offers product integration, localization, customer training and after-sale service”.⁵⁰¹ Resonant is “operated out of Santa Barbara California”.⁵⁰²</p>
<p>2nd CIEPE (2004)⁵⁰³</p>	
<p>“General Motor”</p>	<p>General Motors “designs, builds, and sells cars, trucks, crossovers, and automobile parts” and is headquartered in Michigan, US.⁵⁰⁴</p>
<p>“Honey Well”</p>	<p>Honeywell is a “global leader in providing customers with high-performance specialty materials, including fluorocarbons, advanced fibers and composites, specialty additives and films, customized research chemicals, electronic materials and chemicals, and technology and materials for petrochemical refining”.⁵⁰⁵ Honeywell is headquartered in North Carolina, US.⁵⁰⁶</p>

Table 3: US participants in CIEPE (Source: Exhibitor lists)

Appendix D: Agents of US Companies at the 5th CIEPE

Some of the companies from China and Hong Kong that participate in CIEPE claim to be the agents of US companies. Drawing from a directory that provides detailed descriptions of exhibitors,⁵⁰⁷ this appendix includes a non-exhaustive list of 20 examples of such self-described agents that participated in the 5th CIEPE in 2010.

Company	Description
“MORNING SUN (TIANJIN) INT’L Co., LTD. (美阳 (天津) 国际有限公司)” [Morning Sun (Tianjin) International Co., Ltd.]	At the 5th CIEPE, Morning Sun (Tianjin) International Co., Ltd. claimed to represent US-based companies Garrett Electronics Inc., ⁵⁰⁸ Astrophysics Inc., ⁵⁰⁹ and Bullard. ⁵¹⁰ The company’s website currently makes identical claims. ⁵¹¹ At the 5th CIEPE, Morning Sun (Tianjin) International Co., Ltd. appears to have displayed security inspection products from the aforementioned US companies, namely metal detectors and X-ray equipment.
“BEIJING WAEVT INDUSTRIAL ENDOSCOPE COMPANY LIMITED (北京韦意威特工业内窥镜有限公司)” [Beijing WAEVT Industrial Endoscope Co., Ltd.]	At the 5th CIEPE, Beijing WAEVT Industrial Endoscope Co., Ltd. indicated that it was a distributor of Everest VIT, which it described as part of General Electric (GE) Inspection Technologies. GE Inspection Technologies, which is headquartered in Germany, announced in 2005 that it would acquire Everest VIT, a US-based company. ⁵¹² Beijing WAEVT Industrial Endoscope Co., Ltd.’s website currently claims that it is still responsible for the distribution of Everest VIT technology in China, ⁵¹³ albeit under a new name since GE Inspection Technologies merged with US-based Baker Hughes in 2017 and rebranded as Waygate Technologies in 2020. ⁵¹⁴ At the 5th CIEPE, Beijing WAEVT Industrial Endoscope Co., Ltd. highlighted the military and law enforcement applications of Everest VIT’s visual inspection technology and appears to have displayed products oriented toward counterterrorism.
“北京中瑞生生动力科贸有限公司” [Beijing Zhongrui Shengsheng Power Science Trading Co., Ltd.]	At the 5th CIEPE, Beijing Zhongrui Shengsheng Power Science Trading Co., Ltd. claimed to be an agent for MAGLITE flashlight products, which are products of US-based company Mag Instrument Inc. ⁵¹⁵
“大华国际股份有限公司” [Dahua International Stock Co., Ltd.]	At the 5th CIEPE, Dahua International Stock Co., Ltd. claimed to be an agent for US-based company DKL International Inc.’s life detection instruments, ⁵¹⁶ as well as for other US and European security, counterterrorism, and rescue products.
“Ancom Systems Inc. / Beijing Kelikang Technology & Trade Co., Ltd. (北京科力康技贸有限公司)”	At the 5th CIEPE, Beijing Kelikang Technology & Trade Co., Ltd. claimed to supply the MPS, PLA Navy, and PAP with “a large variety of advanced equipments from other countries” and reported that it would be exhibiting camera, rappel, chemical detection, and other such products from US-based companies Zistos Corporation, ⁵¹⁷ CMC Rescue Inc., ⁵¹⁸ and Morphix Technologies. ⁵¹⁹ On its website, Ancom Systems Inc. currently claims to be an agent for “CMC, Cutters Edge, DarkWater, DOA, Extractor, FLIR, Firecraft, Morphix, NK, Oceanid, OTS, RJE, RSI, Sea Eagle, Sterling Rope, Subacqua, Tetracore, Ursuk, Zistos”. ⁵²⁰
“Shenzhen Crazy Horse Economic Trade Co., Ltd (深圳市悍马经贸有限公司)”	At the 5th CIEPE, Shenzhen Crazy Horse Economic Trade Co., Ltd. claimed to be an agent for US-based police and military apparel companies Blackhawk, ⁵²¹ 5.11 Inc., ⁵²² Luminox, ⁵²³ and Alpha Industries Inc. ⁵²⁴ Shenzhen Crazy Horse Economic Trade Co., Ltd.’s website currently claims that the company represents the aforementioned US companies, among others. ⁵²⁵
“Beijing YHY Co., Ltd. (北京银河星月科技有限公司)” [Beijing Yin He Xing Yue Technology Co., Ltd.]	At the 5th CIEPE, Beijing Yin He Xing Yue Technology Co., Ltd. claimed to represent US-based companies Eye Safety Systems, Inc., ⁵²⁶ Leatherman Tool Group Inc., ⁵²⁷ and Rocky, ⁵²⁸ which offer products such as military apparel and equipment. Beijing Yin He Xing Yue Technology Co., Ltd.’s website currently still lists products from foreign companies like Leatherman Tool Group Inc. and Eye Safety Systems, Inc. ⁵²⁹
“北京金华龙经贸有限公司 (Beijing Jinhualong Trading Co., Ltd.)”	At the 5th CIEPE, Beijing Jinhualong Trading Co., Ltd. claimed to represent “world famous warning equipment companies from USA, Japan, Australia, and Germany”.

<p>“China Pioneer Traffic High-Tech CO., Ltd. (沈阳广信先锋交通高技术有限公司) [Shenyang Guangxin Pioneer Traffic High Technology Co., Ltd.]</p>	<p>At the 5th CIEPE, Shenyang Guangxin Pioneer Traffic High Technology Co., Ltd. claimed to represent US-based companies Federal Signal Corporation,⁵³⁰ CODE 3,⁵³¹ SoundOff Signal,⁵³² Will-Burt Company,⁵³³ and Intoximeters,⁵³⁴ which offer products in police sirens, lighting, and other areas. Corporate records associated with Shenyang Guangxin Pioneer Traffic High Technology Co., Ltd. include an almost identical list of US companies.⁵³⁵</p>
<p>“北京中泰通科技发展有限公司” [Beijing Zhongtaitong Science and Technology Development Co., Ltd.]</p>	<p>At the 5th CIEPE, Beijing Zhongtaitong Science and Technology Development Co., Ltd. claimed to be an agent for counterterrorism products from Russian, UK, US, French, and German companies. According to its website, Beijing Zhongtaitong Science and Technology Development Co., Ltd. introduces advanced equipment into the Chinese market to serve clients like the PLA, PAP, and MPS.⁵³⁶</p>
<p>“Beijing Dingyong Forensic Science & Technology Ltd. (北京鼎永泰克科技有限公司)” [Beijing Dingyong Taike Science and Technology Co., Ltd.]</p>	<p>At the 5th CIEPE, Beijing Dingyong Forensic Science & Technology Ltd. claimed to be exhibiting laser and microspectrometer products from US-based companies Coherent, Inc. and CRAIC Technologies.⁵³⁷</p>
<p>“NBL Imaging System Ltd. (广州星博科仪有限公司)” [Guangzhou Xingbo Scientific Instruments Co., Ltd.]</p>	<p>At the 5th CIEPE, NBL Imaging System Ltd. claimed to sell liquid-crystal adjustable multispectral analysis systems from “US CRI Company” to China’s public security system. The referenced “US CRI Company” was almost certainly Cambridge Research & Instrumentation (CRi), which US-based Caliper Life Sciences acquired in 2010.⁵³⁸ US-based PerkinElmer, Inc. acquired Caliper Life Sciences in 2011.⁵³⁹ NBL Imaging System Ltd.’s website still shows products from PerkinElmer.⁵⁴⁰</p>
<p>“Beijing HongYeXing Technology & Trade Co., Ltd. (北京宏业兴科贸有限责任公司)”</p>	<p>At the 5th CIEPE, Beijing HongYeXing Technology & Trade Co., Ltd. claimed to be an agent for US-based Firetide, Inc.’s “HotPort high-performance network wireless mesh network products”.⁵⁴¹</p>
<p>“Beijing LongHope Police Equipment Co., Ltd. (北京龙昊安华警用器材科技有限公司)” [Beijing Longhao Anhua Police Device Materials Science and Technology Co., Ltd.]</p>	<p>At the 5th CIEPE, Beijing LongHope Police Equipment Co., Ltd. claimed to represent companies like US-based SPEX Forensics⁵⁴² and “PI” (likely referring to Princeton Instruments),⁵⁴³ which offer products in areas like forensics and optics. Archived versions of Beijing LongHope Police Equipment Co., Ltd.’s website describe it as the agent for (and feature products from) US-based companies like SPEX Forensics.⁵⁴⁴</p>
<p>“Easy Orient Trading Co., Ltd. (北京怡然奥润商贸有限公司)” [Beijing Happy Aoran Trading Co., Ltd.]</p>	<p>At the 5th CIEPE, Easy Orient Trading Co., Ltd. claimed to represent companies such as US-based ATN Corp and Burris Optics,⁵⁴⁵ which provide optical products.</p>
<p>“Beijing Ritchie’s Time Hi-tech Development Co., Ltd (北京瑞琦新宇科技有限公司)” [Beijing Ruiqi Xinyu Science and Technology Co., Ltd.]</p>	<p>At the 5th CIEPE, Beijing Ruiqi Xinyu Science and Technology Co., Ltd. described itself as representing US explosive ordnance disposal robots, among other counterterrorism and anti-explosive products.</p>
<p>“PTE SYSTEMS LTD (卓诚动力有限公司)” [Zhuocheng Power Co., Ltd.]</p>	<p>At the 5th CIEPE, PTE Systems Ltd. claimed to sell and service aviation products from US-based Cessna,⁵⁴⁶ Robinson Helicopter Company,⁵⁴⁷ and Air Tractor, Inc.⁵⁴⁸ The website of PTE Systems Ltd. currently highlights products from Robinson Helicopter Company and Air Tractor, Inc.⁵⁴⁹</p>
<p>“SHENZHEN GOLD PICTURE KING TECHNOLOGY CO.LTD. (深圳市金画王技术有限公司)”</p>	<p>At the 5th CIEPE, Shenzhen Gold Picture King Technology Co., Ltd. claimed to be the agent for products such as a “US needle prick defense gloves” and a “US radar life detector”.</p>
<p>“Shenzhen Forensic Science & Technology Co., Ltd (深圳市福莱斯克开发有限公司)” [Shenzhen Fucai Sike Development Co., Ltd.]</p>	<p>At the 5th CIEPE, Shenzhen Forensic Science & Technology Co., Ltd. described itself as an agent for US-based Cognitech, Inc.’s video fuzzy image analysis processing system,⁵⁵⁰ US-based Elephant Engineering’s ultraviolet observation camera system,⁵⁵¹ and numerous other products from other such US companies.</p>

“Zhongshen Bairui (Beijing) Police Equipment Co., Ltd. (中深百瑞 (北京) 警用设备有限公司)” and “Shanxi Zhongshen Science & Technology Development Co., Ltd. (山西中深科技发展有限公司)”	At the 5th CIEPE, Zhongshen Bairui (Beijing) Police Equipment Co., Ltd. and Shanxi Zhongshen Science & Technology Development Co., Ltd. said that they were an agent for companies from the US, Canada, UK, Germany, Russia, Israel, and Japan.
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Table 4: Agents of US companies at the 5th CIEPE (Source: Exhibitor list)

Appendix E: Ryan Technologies' Addresses in China

Ryan Technologies' website states that the company has 6 Chinese addresses, which are listed in this appendix.

Location	English	Chinese
Beijing ⁵⁵²	"Longsheng Plaza, Tower B, 10th Floor, Jia 5, RongChang-DongJie, BDA (YiZhuang), Beijing, 100176, China"	"北京市北京经济技术开发区荣昌东街甲5号 2号楼 10层 1001"
Shanghai ⁵⁵³	"XuHui Hongqiao International Plaza, Room 513, 288 Tong Xie Road, Shanghai, 200335, China"	"上海市长宁区通协路288弄 旭辉虹桥国际2号楼 513室"
Wuhan ⁵⁵⁴	"Zhong Shang Plaza, Tower A, Room 1902, No.7 Zhongnan Road, Wuchang District, Wuhan, 430071, China"	"武汉市武昌区中南路7号 中商广场写字楼 A1902室"
Chengdu ⁵⁵⁵	"New Times Plaza, Rooms D&E of the 14th Floor, 42 Wenwu Road, Xinhua Ave, Qingyang District, Chengdu, 610017, China"	"四川省成都市青羊区新华大道文武路新时代广场 14D E"
Guangzhou ⁵⁵⁶	"Asia International Hotel No.326, Room 2106, Section 1, Huanshi Dong Road, Guangzhou, Guangdong, 510060, China"	"广东省广州市越秀区环市东路一区326号新亚洲国际酒店 2106室"
Shenyang ⁵⁵⁷	"Liaoning Hotel, Room 200, No.97 Zhongshan Road, Heping District, Shenyang, China"	"沈阳市和平区中山路97号 辽宁宾馆200室"

Table 5: Ryan Technologies' Addresses in China (Source: Ryan Technologies)

Appendix F: Technology from US Companies in Hainan's Public Security Information Systems

This appendix identifies products from IBM, H3C, Cisco, Comtech, and Motorola, all of which are US-based or US-invested companies, that are almost certainly used in Hainan Province's public security information systems.⁵⁵⁸

Product Name	Manufacturer	Model	Quantity	Document Year(s)
Server (Phase 2)	IBM	X3650M3	8	2019
Server (Phase 1)	IBM	X3650M	1	2019
Server (Phase 1)	IBM	X345	7	2019
Server (Phase 1)	IBM	X346	1	2019
Network Security Switch	Cisco	CISCO Catalyst 2950	1	2019
Network Security Switch	H3C	H3C S5120	1	2019

Table 6: IBM, Cisco, and H3C technology in the Hainan Province Public Security PKI/PMI Platform (Source: Hainan Province Public Security Department)

Product Name	Manufacturer	Model	Quantity	Document Year(s)
"COTM" Satellite Communications Vehicle (Ford)				
Satellite Modem	Comtech	Comtech CDM600L	1	2019, 2021
Network Management Modem	Comtech	CDM570L	1	2019, 2021
Vehicle-based Shortband Radio	Motorola	Motorola GM3688	1	2019, 2021
Network Switch	Cisco	Cisco SRW2016	1	2019, 2021
Image Collection Vehicle (Ford)				
Vehicle-based Shortband Radio	Motorola	Motorola GM3688	1	2019, 2021
Satellite Ground Station (Ford)				
Satellite Modem	Comtech	CDM-600L	1	2019, 2021
"COTM" Satellite Communications Vehicle (Mercedes-Benz)				
350MHZ Vehicle-Based	Motorola	Motorola GM3688	1	2019, 2021
3-Level Network Switch	H3C	H3C S5120-29P-SI	1	2019, 2021
Network Management MOD	Comtech	Comtech CDM570L	1	2019, 2021
Service MOD	Comtech	Comtech 600L TPC	1	2019, 2021
Satellite Ground Station (Mercedes-Benz)				
Satellite Service Modem	Comtech	Comtech CDN600L TPC	5	2019, 2021
Protocol Converter	Comtech	Comtech CIM25	5	2019, 2021

Table 7: Comtech, Motorola, Cisco, and H3C technology in the Hainan Province Public Security "COTM" Satellite Communications System (Source: Hainan Province Public Security Department)

Product Name	Manufacturer	Model	Quantity	Document Year(s)
3-Level Network Switch	H3C	S5500-28C-SI	2	2019, 2020, 2021
Network Switch	H3C	S5500-28C-SI	1	2019, 2020, 2021
Router	H3C	MSR-5040	3	2019, 2020, 2021
IDS Management Server	IBM	X3550 M2	2	2019, 2020, 2021
IPS Management Server	IBM	X3550 M2	2	2019, 2020, 2021
Antivirus Control Server	IBM	X3550 M2	1	2019, 2020, 2021
Premises Server	IBM	IBM X3650 M2	2	2019, 22020, 021

Table 8: H3C and IBM technology in the Public Security Information Network Border Security Access Platform (Source: Hainan Province Public Security Department)

Product Name	Manufacturer	Model	Quantity	Document Year(s)
AC Power Source Module	H3C	H3C/LSUM1AC2500	8	2019, 2020
Exchange Routing Engine	H3C	H3C/LSUM1SUPA0	8	2019, 2020
Ethernet Electrical Interface Board	H3C	H3C/LSU1GT48SE	4	2019, 2020
Optical Interface	H3C	H3C/LSU1GP24TXSE0	4	2019, 2020

Table 9: H3C technology in the internet and public security network sections of the Hainan Province Public Security Department's LAN (Source: Hainan Province Public Security Department)

Product Name	Manufacturer	Model	Quantity	Document Year(s)
Provincial Department Core Switches				
Provincial Department Core Switch	H3C	H3C S12518 Host Case (with various other parts)	2	2019, 2020, 2021
Provincial Department Core Switch Flow Analysis Card	H3C	H3C S12500, NetStream Service Board	2	2019, 2020, 2021
Provincial Department Core Switch Firewall Card	H3C	H3C S12500, FW-III Firewall Service Board	2	2019, 202, 2021
Optical Module	H3C	H3C Optical Module-SFP-GE-Single Module	38	2019, 2020, 2021
Optical Modules	H3C	H3C SFP+ 10 Gigabit Module	4	2019, 2020, 2021
City and County Convergence Switches				
City and County Convergence Switch	H3C	H3C S708E-X Host Case (with various other parts)	20	2019, 2020, 2021
Optical Modules	H3C	H3C Optical Module-SFP-GE-Single Module	20	2019
Provincial Department LAN Convergence Switches				
LAN Convergence Switch	H3C	H3C S5500-28F-EI-Ethernet Switch Host	2	2019, 2020, 2021

Optical Module-SFP-GE-Single Module	H3C	H3C Optical Module-SFP-GE-Single Module	32	2019
Provincial Department LAN Access Switches				
LAN Access Switch	H3C	H3C S5120-24P-EI-Ethernet Switch Host	16	2019, 2020, 2021
Optical Module-SFP-GE-Single Module	H3C	H3C Optical Module-SFP-GE-Single Module	32	2019
Network Management Platform				
Network Management Platform	H3C	H3C iMC-Intelligent Management Platform Standard Version (with various other parts)	1	2019, 2020
Network Management Server	H3C	H3C FlexServer R390	2	2019, 2020, 2021
Network Management Server Virtualization Software	H3C	H3C CAS Cloud Computing Management Platform Standard Version	1	2019, 2020
Routers				
Router	H3C	H3C MSR 3640 Router Host (with various other parts)	2	2019, 2020, 2021

Table 10: H3C technology in the Public Security Network Upgrade and Transformation (Video Transmission) Project (Source: Hainan Province Public Security Department)

Appendix G: Surveillance-Related HDD Purchases in Xinjiang

Publicly available procurement records reveal that Xinjiang public security entities have recently carried out numerous surveillance-related purchases of drives from US-based Seagate and Western Digital.⁵⁵⁹ Examples of such purchases from early-mid 2022 are listed in the tables below.

Date	End User	Drive Type	Model	Quantity
April 2022	Akqi County Public Security Bureau (阿合奇县公安局)	Computer	ST8000DM0004	6
Additional Details: The bureau purchased the 6 Seagate computer HDDs alongside 13 high-resolution cameras from Hikvision.				
April 2022	XUAR Public Security Department Food, Drug, and Environmental Crimes Investigation Bureau Altay Mountains Sub-Bureau (自治区公安厅食品药品环境犯罪侦查局阿尔泰山分局)	Surveillance (SkyHawk)	ST8000VX0022	1
Additional Details: N/A				
April 2022	Urumqi City Public Security Bureau Tianshan Sub-Bureau (乌鲁木齐市公安局天山区分局)	Surveillance (SkyHawk)	ST8000VX0022	4
Additional Details: N/A				
April 2022	Urumqi City Public Security Bureau Tianshan Sub-Bureau (乌鲁木齐市公安局天山区分局)	Surveillance (SkyHawk)	ST8000VX0022	4
Additional Details: N/A				
March 2022	Kuytun City Public Security Bureau (奎屯市公安局)	Portable	STDT6000	6
Additional Details: The bureau purchased the 6 Seagate portable drives alongside 12 infrared cameras and a DVR from Hikvision.				
January 2022	Bortala Mongol Autonomous Prefecture Public Security Bureau (博尔塔拉蒙古自治州公安局)	Surveillance	ST6000VX0023	4
Additional Details: The bureau purchased the 4 SkyHawk surveillance drives alongside 12 infrared cameras and a DVR from Hikvision.				
January 2022	Changji Hui Autonomous Prefecture Public Security Bureau Zhudong Economic and Technological Development Zone Sub-Bureau (昌吉州公安局准东经济技术开发区分局)	Surveillance (SkyHawk)	ST4000VX005	10
Additional Details: N/A				
January 2022	Urumqi County Public Security Bureau (乌鲁木齐县公安局)	Surveillance	ST8000VX0002	4

Additional Details: The bureau purchased the 4 SkyHawk surveillance drives alongside 8 intelligent infrared hemisphere cameras, 2 infrared network cameras, a DVR, and other equipment from Uniview as part of a “integrated monitoring and control system” project.				
January 2022	Guqung County Public Security Bureau (奇台县公安局)	Surveillance (SkyHawk)	ST6000VX001	5
Additional Details: The bureau described the SkyHawk surveillance drives as “Dahua-Seagate surveillance-grade hard disks”.				
January 2022	Keriya County Public Security Bureau (于田县公安局)	NAS	ST4000VN008	1
Additional Details: The bureau purchased the Seagate NAS drives alongside a video recorder and other equipment from Dahua.				

Table 11: Surveillance-related purchases of Seagate HDDs by Xinjiang public security entities in early-mid 2022 (Source: Various public security entities)

Date	End User	Drive Type	Model	Quantity
April 2022	Akqi County Public Security Bureau (阿合奇县公安局)	Portable	WDBPKJ0050BBK	10
Additional Details: The bureau purchased the 10 Western Digital portable drives alongside 13 high resolution cameras from Hikvision.				
February 2022	Kuytun City Public Security Bureau (奎屯市公安局)	Data Center	HUS728T8TALE6L4	16
Additional Details: The bureau purchased 16 Western Digital data center drives, which it described as “surveillance drives”, alongside 36 infrared cameras, 8 hemisphere cameras, and other equipment from Hikvision as part of a “monitoring and control [i.e., surveillance] equipment” contract.				

Table 12: Surveillance-related purchases of Western Digital HDDs by Xinjiang public security entities in early-mid 2022 (Source: Various public security entities)

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About Insikt Group®

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Endnotes

- 1 "Ministry of Public Security" [公安部], China Government Net [中国政府网], <https://archive.ph/11M4j>.
- 2 "Ministry of Public Security Party Committee Holds Education and Rectification Special Topic Democratic Life Meeting" [公安部党委召开教育整顿专题民主生活会], National Immigration Administration [国家移民管理局], November 1, 2021, <https://archive.ph/nw4Se>.
- 3 "Ministry of Public Security Press Conference Announces 2021 Whole Country Public Security Organs All-Out Effort to Maintain the Country's Political Security and Social Stability Achieved Notable Success, And Celebrating 2nd China People's Police Day Related Activities Planning Situation" [公安部新闻发布会通报2021年全国公安机关全力以赴维护国家政治安全和社会稳定取得的显著成效, 以及庆祝第二个中国人民警察节相关活动安排等情况], China Government Net [中国政府网], January 11, 2022, <https://archive.ph/DZSQp>; Jichang Lulu and Filip Jirouš, Back to the Cheka: The Ministry of Public Security's political protection work (Sinopsis, 2022), https://sinopsis.cz/en/mps1b/?utm_source=rssfeed&utm_medium=rss&utm_campaign=rssweb.
- 4 The hukou system is a household registration system that controls population movement and determines access to employment, education, housing, and other services. See Wayne M. Morrison, China's Hukou System: Overview, Reform, and Economic Implications (Congressional Research Service, 2016), https://www.everycrsreport.com/files/2016-01-07_IF10344_90e25c2b4c5b85546abd876c58bd96164f0d2dd5.pdf.
- 5 "Ministry of Public Security", China Government Net.
- 6 Maya Wang, "China's Dystopian Push to Revolutionize Surveillance", Washington Post, August 18, 2017, <https://www.washingtonpost.com/news/democracy-post/wp/2017/08/18/chinas-dystopian-push-to-revolutionize-surveillance/>; Edward Schwarck, "Behind the Golden Shield: China Reforms Public Security Intelligence", China Brief 17, no. 6 (2017), <https://jamestown.org/program/behind-golden-shield-china-reforms-public-security-intelligence/>; Katherine Atha et al., China's Smart Cities Development (SOS International LLC, 2020), <https://www.uscc.gov/research/chinas-smart-cities-development>.
- 7 Alex Joske, Secret police: The Ministry of Public Security's clandestine foreign operations (Sinopsis, 2022), https://sinopsis.cz/en/mps/?utm_source=rssfeed&utm_medium=rss&utm_campaign=rssweb; Lulu and Jirouš, Back to the Cheka; Sebastian Rotella and Kirsten Berg, "Operation Fox Hunt: How China Exports Repression Using a Network of Spies Hidden in Plain Sight", ProPublica, July 22, 2021, <https://www.propublica.org/article/operation-fox-hunt-how-china-exports-repression-using-a-network-of-spies-hidden-in-plain-sight>; "Eight Individuals Charged With Conspiring to Act as Illegal Agents of the People's Republic of China", US Department of Justice, October 28, 2020, <https://www.justice.gov/opa/pr/eight-individuals-charged-conspiring-act-illegal-agents-people-s-republic-china>.
- 8 "Loyal Teachers Undertake a Sacred Mission, Public Security Invincible Army Writes a New Chapter, Comrades Responsible at Bureau-Level Units Directly Subordinate to the Ministry of Public Security Seriously Study and Implement the Spirit of General Secretary Xi Jinping's Important Speech at the Whole Country Public Security Work Conference" [忠诚之师担当神圣使命 公安铁军书写崭新篇章 与会公安部直属机关局级单位负责同志认真贯彻落实习近平总书记在全国公安工作会议上的重要讲话精神], PRC Ministry of Public Security [中华人民共和国公安部], May 10, 2019, <https://archive.ph/7BQyl>.
- 9 I.e., MPS bureaus and entities that have the same organizational status as MPS bureaus.
- 10 "Public Security Organs Organizational Management Regulations" [公安机关组织管理条例], China Government Net [中国政府网], November 13, 2006, <https://archive.ph/3foba>.
- 11 "Public Security Organs Organizational Management Regulations".
- 12 "PRC Detention Center Regulations" [中华人民共和国看守所条例], China Government Net [中国政府网], March 17, 1990, <https://archive.ph/gfxUA>; "Prison Management Zhidui" [监所管理支队], Hangzhou City People's Government Net [杭州市人民政府门户网站], <https://archive.ph/5dtEW>; "P.R.C. Law on Detention Centers (Draft for Public Solicitation of Comments)", China Law Translate, June 19, 2017, <https://www.chinalawtranslate.com/en/p-r-c-law-on-detention-centers-draft-for-public-solicitation-of-comments/>.
- 13 "PRC Prison Law" [中华人民共和国监狱法], Beijing Court Law and Regulation Lookup [北京法院法规检索], December 29, 1994, <https://archive.ph/rL0qy>; "IV. Jail System", China.org.cn, <https://archive.ph/mor6m>.
- 14 "PRC People's Police Law" [中华人民共和国人民警察法], Beijing Traffic Management Bureau [北京市公安局公安交通管理局], February 28, 1995, <https://archive.ph/UXA3H>; China: Structure of the public security police; whether witness protection programs exist for those fearing organized crime groups (2014) (Immigration and Refugee Board of Canada, 2014), <https://www.refworld.org/docid/54648cbd4.html>.
- 15 Liu Ziyang [刘子阳], "Public Security Border Defense Force and Public Security Guards Force Hold Collective Ceremony for Switching Uniforms and Taking Police Oaths" [公安边防、警卫部队举行集体换装和入警宣誓仪式], Xinhua Net [新华网], January 2, 2019, <https://archive.ph/yPVCd>.
- 16 Joel Wuthnow, China's Other Army: The People's Armed Police in an Era of Reform, China Strategic Perspectives 14 (Institute for National Strategic Studies, 2019), <https://inss.ndu.edu/Media/News/Article/1815868/chinas-other-army-the-peoples-armed-police-in-an-era-of-reform/>.
- 17 Liu, "Public Security Border Defense Force and Public Security Guards Force".
- 18 "PRC People's Police Law"; "PRC Prison Law"; Zhou Bin [周斌] and Zhang Hao [张昊], "State Security Organs Are What Kind of Team? Ministry of State Security Information Office Answers Reporters' Questions" [国家安全机关是怎样一支队伍? 国安部新闻办答记者问], Guizhou Province Zheng'an County People's Procuratorate (国家安全机关是怎样一支队伍? 国安部新闻办答记者问), January 11, 2021, <https://archive.ph/o3U0n>; "People's Court Judicial Police Provisional Regulations" [人民法院司法警察暂行条例], PRC Supreme People's Court [中华人民共和国最高人民法院], February 21, 2010, <https://archive.ph/MIDIS>; "People's Procuratorate Judicial Police Regulations" [人民检察院司法警察条例], PRC Supreme People's Procuratorate [中华人民共和国最高人民检察院], May 23, 2013, <https://archive.ph/UfPQ7>.
- 19 "Public Security Organs People's Police Oath' Announced" [《公安机关人民警察誓词》公布], China Government Net [中国政府网], November 18, 2021, <https://archive.ph/rPddl>.
- 20 For the purposes of this report, we use the definition of state violence from the Encyclopedia of Interpersonal Violence. Other relevant definitions can be observed in sources such as The Cambridge Handbook of Social Problems and State Violence in East Asia. See David Kauzlarich, "State Violence" in Encyclopedia of Interpersonal Violence, eds. Claire M. Renzetti and Jeffrey L. Edleson (SAGE Publications, Inc., 2008), <https://us.sagepub.com/en-us/nam/encyclopedia-of-interpersonal-violence/book227867#description>; M. Gabriela Torres, "Chapter 22 - State Violence" in The Cambridge Handbook of Social Problems, ed. A. Javier Treviño (Cambridge University Press, 2018), <https://www.cambridge.org/core/books/abs/cambridge-handbook-of-social-problems/state-violence/CB1CD884DD53026BC4DD7C1F1FD70DD3>; Sung Chull Kim and N. Ganesan, "Introduction: Conceiving State Violence, Justice, and Transition in East Asia" in State Violence in East Asia, eds. N. Ganesan and Sung Chull Kim (University of Kentucky, 2013), <https://www.jstor.org/stable/j.ctt2jcp1p>.
- 21 Kauzlarich, "State Violence".
- 22 For example, see Kauzlarich, "State Violence"; Torres, "State Violence"; Ganesan and Kim, "Conceiving State Violence".
- 23 Annual Report 2021 (Congressional-Executive Commission on China, 2022), <https://www.cecc.gov/publications/annual-reports/cecc-annual-report-2021/>.
- 24 Annual Report 2020 (Congressional-Executive Commission on China, 2021), <https://www.cecc.gov/publications/annual-reports/2020-annual-report>.
- 25 Annual Report 2020; "NPCSC Abolishes 'Custody & Education' Detention System, Revises Securities Law & Approves Community Corrections Law, Civil Litigation Reform Pilot", NPC Observer, December 30, 2019, <https://npcobserver.com/2019/12/30/npcsc-abolishes-custody-education-detention-system-revises-securities-law-approves->

- community-corrections-law-civil-litigation-reform-pilot/; Tania Branigan, "China's sex workers face paying for their incarceration", The Guardian, December 19, 2013, <https://www.theguardian.com/world/2013/dec/19/china-sex-workers-pay-incarceration>.
- 26 Eileen Yuk-ha Tsang, "A Sisterhood of Hope: How China's Transgender Sex Workers Cope with Intimate Partner Violence", International Journal of Environmental Research and Public Health 17, no. 21 (2020), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7672577/>; "My Life Is Too Dark to See the Light": A Survey of the Living Conditions of Transgender Female Sex Workers in Beijing and Shanghai (Asia Catalyst, 2015), <https://asiacatalyst.org/wp-content/uploads/2014/09/Asia-Catalyst-TG-SW-Report.pdf>.
- 27 Schwarck, "Behind the Golden Shield"; Atha et al., China's Smart Cities Development; Greg Walton, China's Golden Shield: Corporations and the Development of Surveillance Technology in the People's Republic of China (International Centre for Human Rights and Democratic Development, 2001), <https://publications.gc.ca/site/eng/9.696199/publication.html>.
- 28 Different sources provide different start dates for the project, generally falling between 1999 and 2003. See Shi Guosheng [石国胜], "Whole Country Public Security Informatization Construction Project 'Golden Shield Project' Goes Through National Inspection and Acceptance" [全国公安信息化建设项目"金盾工程"通过国家验收], China Government Net [中国政府网], November 17, 2006, <https://archive.ph/pJsL0>; "Golden Shield Project" [金盾工程], China Net [中国网], February 27, 2002, https://web.archive.org/web/20100714182123/http://www.china.com.cn/zhuanti2005/txt/2003-02/27/content_5283732.htm; Walton, China's Golden Shield; "Ministry of Public Security Ministry-Level Population Information Management System Project Starts" [公安部部级人口信息管理系统项目开发], Neusoft, <https://archive.ph/ztxhp>.
- 29 The Chinese concept of informatization "describes the process of moving toward greater collection, systematization, distribution, and utilization of information" and "affects and shapes all aspects of society, including the economy and governance, as well as warfare". Joe McReynolds and James Mulvenon, "The Role of Informatization in the People's Liberation Army Under Hu Jintao" in Assessing the People's Liberation Army in the Hu Jintao Era, eds. Roy Kamphausen, David Lai, and Travis Tanner (Strategic Studies Institute, 2014), <https://publications.armywarcollege.edu/pubs/2273.pdf>; M. Taylor Fravel, Active Defense: China's Military Strategy since 1949 (Princeton University Press, 2019).
- 30 "'Golden Shield Project' First Phase Construction Basically Complete, Using Information to Solve Cases Accounts for 20 Percent" ["金盾工程"一期建设基本完成 利用信息破案占两成], China Government Net [中国政府网], November 30, 2005, <https://archive.ph/hj7Rc>.
- 31 The other databases are: the National Exit and Entry Personnel Resource Database (全国出入境人员资源库), the National Vehicle/Driver Information Resource Database (全国机动车/驾驶人信息资源库), the National Police Personnel Basic Information Resource Database (全国警员基本信息资源库), the National Resource Database on Fugitives (全国在逃人员信息资源库), the National Stolen Vehicles Information Resource Database (全国被盗抢汽车信息资源库), and the National Security Key Units Information Resource Database (国家安全重点单位信息资源库). See "'Golden Shield Project' First Phase Construction Basically Complete".
- 32 "Ministry of Public Security Ministry-Level Population Information Management System Project Starts"; "Neusoft Population Information Solutions" [东软人口信息解决方案], Neusoft, <https://archive.ph/WBpaM>; "Neusoft Population Information Management System" [东软人口信息管理系统], Neusoft, <https://archive.ph/AxgFu>.
- 33 See the Case Study: Network and Communications Hardware in Hainan Province section for more information about these platforms.
- 34 "'Golden Shield Project' First Phase Construction Basically Complete".
- 35 "Ministry of Public Security Holds Whole Country 'Golden Shield Project' Second Phase Work Conference in Zhengzhou" [公安部在郑州召开全国"金盾工程"二期工作会议], China Government Net [中国政府网], January 15, 2009, <https://archive.ph/lWzQt>; "Ministry of Public Security: Public Security Science and Technology Informatization Construction and Application 4 Highlights Emerge" [公安部：公安科技信息化建设与应用呈现四大亮点], China Government Net [中国政府网], March 9, 2010, <https://archive.ph/88nWF>.
- 36 See the Case Study: Network and Communications Hardware in Hainan Province section for more information about these platforms.
- 37 "Ministry of Public Security Holds Whole Country 'Golden Shield Project' Second Phase Work Conference"; "Ministry of Public Security: Public Security Science and Technology Informatization Construction and Application 4 Highlights Emerge".
- 38 Atha et al., China's Smart Cities Development.
- 39 John Sudworth, "Xinjiang Police Files: Inside a Chinese internment camp", BBC, May 24, 2022, <https://www.bbc.co.uk/news/resources/idt-8df450b3-5d6d-4ed8-bdcc-bd99137eadc3>; Austin Ramzy and Chris Buckley, "'Absolutely No Mercy': Leaked Files Expose How China Organized Mass Detentions of Muslims", The New York Times, November 16, 2019, <https://www.nytimes.com/interactive/2019/11/16/world/asia/china-xinjiang-documents.html>; Megha Rajagopalan, Alison Killing, and Christo Buschek, "China Secretly Built A Vast New Infrastructure To Imprison Muslims", BuzzFeed, August 27, 2020, <https://www.buzzfeednews.com/article/meghara/china-new-internment-camps-xinjiang-uyghurs-muslims>; Vicky Xiuzhong Xu, Danielle Cave, James Leibold, Kelsey Munro, and Nathan Ruser, Uyghurs for sale: 'Re-education', forced labour and surveillance beyond Xinjiang (Australian Strategic Policy Institute, 2020), <https://www.aspi.org.au/report/uyghurs-sale>; Sheena Chestnut Greitens, Myunghee Lee, and Emir Yazici, "Counterterrorism and Preventive Repression: China's Changing Strategy in Xinjiang", International Security 44, no. 3 (2020), <https://direct.mit.edu/isec/article/44/3/9/12280/Counterterrorism-and-Preventive-Repression-China-s>; Ben Mauk, "Inside Xinjiang's Prison State", New Yorker, February 26, 2021, <https://www.newyorker.com/news/a-reporter-at-large/china-xinjiang-prison-state-uyghur-detention-camps-prisoner-testimony>; Thomas Lum and Michael A. Weber, China Primer: Uyghurs (Congressional Research Service, 2022), <https://crsreports.congress.gov/product/pdf/IF/IF10281>; Jake Eberts, "Breaking Down the Xinjiang Crisis", the woke global times, June 2021, <https://wokeglobaltimes.com/xinjiang>.
- 40 "China: Big Data Fuels Crackdown in Minority Region", Human Rights Watch, February 26, 2018, <https://www.hrw.org/news/2018/02/26/china-big-data-fuels-crackdown-minority-region>.
- 41 Maya Wang, "China's Algorithms of Repression: Reverse Engineering a Xinjiang Police Mass Surveillance App", Human Rights Watch, May 1, 2019, <https://www.hrw.org/report/2019/05/01/chinas-algorithms-repression/reverse-engineering-xinjiang-police-mass/>.
- 42 Wang, "China's Algorithms of Repression".
- 43 Wang, "China's Algorithms of Repression".
- 44 Jessica Batke, "Where Did the One Million Figure for Detentions in Xinjiang's Camps Come From?", ChinaFile, January 8, 2019, <https://www.chinafile.com/reporting-opinion/features/where-did-one-million-figure-detentions-xinjiangs-camps-come>.
- 45 Source documents held by Recorded Future.
- 46 Source documents held by Recorded Future.
- 47 Lulu and Jirouš, Back to the Cheka.
- 48 Lulu and Jirouš, Back to the Cheka; Joske, Secret police; Murray Scot Tanner and Peter W. Mackenzie, China's Emerging National Security Interests and Their Impact on the People's Liberation Army (CNA Corporation, 2015), <https://apps.dtic.mil/sti/pdfs/ADA615940.pdf>; Murray Scot Tanner and James Bellaacqua, China's Response to Terrorism (CNA, 2016), https://www.uscc.gov/sites/default/files/Research/Chinas%20Response%20to%20Terrorism_CNA061616.pdf.
- 49 Terms like "dadui", "zhidui", and "zongdui" refer to various levels of Chinese military and law enforcement organization. See Wuthnow, China's Other Army; Kenneth Allen, "Chapter One: Introduction to the PLA's Organizational Reforms: 2000-2012", in The PLA as Organization v.2.0., eds. Kevin Pollpeter and Kenneth Allen (Defense Group Inc., 2015), <https://www.airuniversity.af.edu/CASI/Display/Article/1586201/pla-as-organization-20/>.

- 50 "Domestic Security Protection Dadui Branch" [国内安全保卫大队支部], CCP Nanning City Committee Organization Department [中共南宁市委组织部], <https://archive.ph/vEyIU>.
- 51 "Domestic Security Protection Dadui Branch".
- 52 Lulu and Jirouš, Back to the Cheka; Joske, Secret police.
- 53 Source documents held by Recorded Future.
- 54 Joske, Secret police; Peter Mattis and Matthew Brazil, Chinese Communist Espionage: An Intelligence Primer (Naval Institute Press, 2019).
- 55 "Exit and Entry Administration Law of the People's Republic of China", PRC State Council, September 10, 2014, <https://archive.ph/RyCMD>.
- 56 "Exit and Entry Administration Law of the People's Republic of China".
- 57 "EXCLUSIVE Chinese province targets journalists, foreign students with planned new surveillance system", Reuters, November 29, 2021, <https://www.reuters.com/technology/exclusive-chinese-province-targets-journalists-foreign-students-with-planned-new-2021-11-29/>;
- 58 Peterson, "Foreign Technology and the Surveillance State"; Dahlia Peterson, "How China harnesses data fusion to make sense of surveillance data", Brookings, September 23, 2021, <https://www.brookings.edu/techstream/how-china-harnesses-data-fusion-to-make-sense-of-surveillance-data/>; Dahlia Peterson, Designing Alternatives to China's Repressive Surveillance State (Center for Security and Emerging Technology, 2020), <https://cset.georgetown.edu/wp-content/uploads/CSET-Designing-Alternatives-to-Chinas-Surveillance-State.pdf>.
- 59 Emma Rafaelof, Unfinished Business: Export Control and Foreign Investment Reforms (US-China Economic and Security Review Commission, 2021), <https://www.uscc.gov/research/unfinished-business-export-control-and-foreign-investment-reforms>; "The Export Control Reform Act and Possible New Controls on Emerging and Foundational Technologies", Akin Gump, September 12, 2018, <https://www.akingump.com/en/news-insights/the-export-control-reform-act-of-2018-and-possible-new-controls.html>.
- 60 Karen M. Sutter and Christopher A. Casey, US Export Controls and China (Congressional Research Service, 2022), <https://crsreports.congress.gov/product/pdf/IF/IF11627>; Public Law 115 - 232 - John S. McCain National Defense Authorization Act for Fiscal Year 2019, govinfo, <https://www.govinfo.gov/app/details/PLAW-115publ232/summary>.
- 61 "Addition of Certain Entities to the Entity List", Federal Register, October 9, 2019, <https://www.federalregister.gov/documents/2019/10/09/2019-22210/addition-of-certain-entities-to-the-entity-list>; "Addition of Certain Entities to the Entity List; Revision of Existing Entries on the Entity List", Federal Register, June 5, 2020, <https://www.federalregister.gov/documents/2020/06/05/2020-10868/addition-of-certain-entities-to-the-entity-list-revision-of-existing-entries-on-the-entity-list>; "Addition of Certain Entities to the Entity List; Revision of Existing Entries on the Entity List", July 22, 2020, <https://www.federalregister.gov/documents/2020/07/22/2020-15827/addition-of-certain-entities-to-the-entity-list-revision-of-existing-entries-on-the-entity-list>; "Addition of Entities to the Entity List; Corrections to Certain Existing Entries on the Entity List", Federal Register, September 22, 2020, <https://www.federalregister.gov/documents/2020/09/22/2020-18515/addition-of-entities-to-the-entity-list-corrections-to-certain-existing-entries-on-the-entity-list>.
- 62 "Entity List", US Department of Commerce Bureau of Industry and Security, <https://www.bis.doc.gov/index.php/policy-guidance/lists-of-parties-of-concern/entity-list>; Sutter and Casey, US Export Controls and China.
- 63 "Addition of Certain Entities to the Entity List".
- 64 "U.S. Signing of the PROTECT Hong Kong Act Sends a Message to the World That People Can Come Before Profit", Amnesty International, November 27, 2019, <https://www.amnestyusa.org/press-releases/u-s-signing-of-the-protect-hong-kong-act-sends-a-message-to-the-world-that-people-can-come-before-profit/>.
- 65 "Safeguarding national security – our collective responsibility", Security Bureau, <https://archive.ph/XtB30>.
- 66 Trampled Orchid: Internet Freedom in Hong Kong (SOS International LLC, 2021), <https://cira.sosi.com/research-analysis/china/cira-report-internet-freedom-in-hong-kong/>.
- 67 See the discussion of export controls in Zoe Haver, "How China is Leveraging Foreign Technology to Dominate the South China Sea", Radio Free Asia, April 19, 2021, <https://www.rfa.org/english/news/special/china-foreign-tech-scs/>.
- 68 Marcel Angvivi de la Beaumelle, Benjamin Spevack, and Devin Thorne, Open Arms: Evaluating Global Exposure to China's Defense-Industrial Base (C4ADS, 2019), <https://static1.squarespace.com/static/566ef8b4d8af107232d5358a/t/5d95fb48a0bfc672d825e346/1570110297719/Open+Arms.pdf>; Emily Weinstein, "Beijing's 're-innovation' strategy is key element of U.S.-China competition", Brookings, January 6, 2022, <https://www.brookings.edu/techstream/beijings-re-innovation-strategy-is-key-element-of-u-s-china-competition/>; William C. Hannas and Didi Kirsten Tatlow, eds., China's Quest for Foreign Technology: Beyond Espionage (Routledge, 2021).
- 69 Dahlia Peterson, "Foreign Technology and the Surveillance State", in China's Quest for Foreign Technology, eds. Hannas and Tatlow.
- 70 Peterson, "Foreign Technology and the Surveillance State".
- 71 For more details on Seagate's surveillance HDDs, see the Case Study: Hard Disk Drives in the Xinjiang Uyghur Autonomous Region section of this report.
- 72 Peterson, "Foreign Technology and the Surveillance State".
- 73 "Addition of Certain Entities to the Entity List".
- 74 "U.S. considers imposing sanctions on China's Hikvision -FT", Reuters, May 5, 2022, <https://www.reuters.com/technology/us-plans-impose-sanctions-chinas-hikvision-ft-2022-05-04/>; Chris Vallance, "CCTV watchdog criticises Hikvision Uyghur response", BBC, August 14, 2021, <https://www.bbc.com/news/technology-58188325>; Charles Rollet, "Hikvision Growing Xinjiang Operations", IPVM, November 30, 2020, <https://ipvm.com/reports/hik-xinjiang>; Samuel Shen and Josh Horwitz, "China's Hikvision sees only limited impact from U.S. blacklisting", Reuters, October 9, 2019, <https://www.reuters.com/article/us-usa-trade-china-hikvision/chinas-hikvision-sees-only-limited-impact-from-u-s-blacklisting-idUSKBN1W0005>; "Hikvision Cameras Covering Concentration Camps", IPVM, July 29, 2019, <https://ipvm.com/reports/hikvision-bbc>.
- 75 Liza Lin and Josh Chin, "U.S. Tech Companies Prop Up China's Vast Surveillance Network", Wall Street Journal, November 26, 2019, <https://www.wsj.com/articles/u-s-tech-companies-prop-up-chinas-vast-surveillance-network-11574786846>.
- 76 Peterson, "Foreign Technology and the Surveillance State".
- 77 Source documents held by Recorded Future.
- 78 "About Us" [关于我们], Shenzhen Zhongjing Sichuang Military Police Equipment Co., Ltd. [深圳市中警思创军警装备有限公司], <https://archive.ph/uE2Sc>; "US 'Cognitech' Professional Video Fuzzy Image Analysis Processing System" [美国"识慧"专业视频模糊图像分析处理系统], Shenzhen Zhongjing Sichuang Military Police Equipment Co., Ltd. [深圳市中警思创军警装备有限公司], <https://archive.ph/TRapz>.
- 79 "US 'Cognitech' Professional Video Fuzzy Image Analysis Processing System".
- 80 "Video Investigator", Cognitech, <https://cognitech.com/cognitech-video-investigator-64/>.
- 81 "Company", Cognitech, <https://cognitech.com/contact-us/company/>.
- 82 "Cognitech", Cognitech, <https://archive.ph/Mat7f>.
- 83 "Cognitech", Cognitech.

- 84 People's procuratorates are not part of China's public security system, but the document includes assessments from public security experts and cites the widespread use of Cognitech, Inc.'s technology by public security entities as part of its justification for making the purchase. "PRC Supreme People's Procuratorate Main Duties" [中华人民共和国最高人民检察院主要职责], PRC Supreme People's Procuratorate [中华人民共和国最高人民检察院], January 3, 2019, <https://archive.ph/fiDW8>.
- 85 Source documents held by Recorded Future.
- 86 Source documents held by Recorded Future.
- 87 Source documents held by Recorded Future.
- 88 Source documents held by Recorded Future.
- 89 Source documents held by Recorded Future.
- 90 Source documents held by Recorded Future.
- 91 Source documents held by Recorded Future.
- 92 Source documents held by Recorded Future.
- 93 Source documents held by Recorded Future.
- 94 Aysha Khan, "Uighurs reflect on 2009 violence that set off Chinese crackdown", Washington Post, July 10, 2020, https://www.washingtonpost.com/religion/uighurs-reflect-on-2009-violence-that-set-off-chinese-crackdown/2020/07/10/03ce53ae-c246-11ea-9fdd-b7ac6b051dc8_story.html.
- 95 Source documents held by Recorded Future.
- 96 Source documents held by Recorded Future.
- 97 Source documents held by Recorded Future.
- 98 Source documents held by Recorded Future.
- 99 "Contact", Research Electronics International, <https://reiusa.net/contact/>.
- 100 "ORION™ 900 HX Non-Linear Junction Detector", Research Electronics International, <https://reiusa.net/nljd/orion-900-hx-nljd/>.
- 101 Source documents held by Recorded Future.
- 102 Source documents held by Recorded Future.
- 103 Source documents held by Recorded Future.
- 104 Source documents held by Recorded Future.
- 105 Source documents held by Recorded Future.
- 106 "About US", L3Harris, <https://www.l3harris.com/about-us>; "3M Help Center", 3M, https://www.3m.com/3M/en_US/company-us/help-center/; "3M Completes Acquisition of Aearo Technologies Inc.", 3M, <https://news.3m.com/2008-04-01-3M-Completes-Acquisition-of-Aearo-Technologies-Inc>; About You", Vortex Optics, <https://vortexoptics.com/about-you>.
- 107 "Contact Us", Steiner Optics, <https://www.steiner-optics.com/contact-us>.
- 108 Source documents held by Recorded Future.
- 109 "Support", Steiner Optics, <https://www.steiner-optics.com/support>; "History", Steiner Optics, <https://www.steiner-optics.com/history>.
- 110 Source documents held by Recorded Future.
- 111 Source documents held by Recorded Future.
- 112 Source documents held by Recorded Future.
- 113 Source documents held by Recorded Future.
- 114 Source documents held by Recorded Future.
- 115 Source documents held by Recorded Future.
- 116 Source documents held by Recorded Future.
- 117 Latent Master 2005: Digital Latent Fingerprint Workstation (Syntronics, LLC), https://www.grimas.hu/wp-content/uploads/2014/02/latent_master.pdf; "LatentMaster UV Viewer (RUVIS) Kit", Syntronics, <http://syntronics.net/latentmaster-uv-viewer.html>.
- 118 "General Atomics Acquires Syntronics, LLC", General Atomics, <https://www.ga.com/general-atomics-acquires-syntronics-llc>.
- 119 Source documents held by Recorded Future.
- 120 User's Manual for Nuance 3.0.2 (PerkinElmer, Inc.), https://resources.perkinelmer.com/corporate/content/1st_software_downloads/tissueimaging/nuanceusermanual_3_0_2_rev0.pdf; "PerkinElmer Company" [PerkinElmer公司], Guangzhou Xingbo Scientific Instruments Co., Ltd. [广州星博科仪有限公司], <https://web.archive.org/web/20180814015814/http://nbl.com.cn/products.html?fid=189949&proTypeID=191471&proTypeName=PerkinElmer%E5%85%AC%E5%8F%B8>; "Nuance Multispectral Imaging Material Evidence Analysis System" [Nuance多光谱成像物证分析系统], Guangzhou Xingbo Scientific Instruments Co., Ltd. [广州星博科仪有限公司], <https://web.archive.org/web/20181226231918/http://nbl.com.cn/displayproduct.html?prodID=2307195>; "Nuance Multispectral Tissue Imaging Systems by PerkinElmer, Inc.", SelectScience, <https://www.selectscience.net/products/nuance-multispectral-tissue-imaging-systems/?prodID=172626#tab-2>; "About Us", PerkinElmer, <https://www.perkinelmer.com/company/about-us/>; "Caliper Life Sciences Completes Previously Announced CRi Acquisition", Technology Networks, December 22, 2010, <https://www.technologynetworks.com/diagnostics/news/caliper-life-sciences-completes-previously-announced-cri-acquisition-189504>; "PerkinElmer to Acquire Caliper Life Sciences for Approximately \$600 Million", PerkinElmer, September 8, 2011, <https://ir.perkinelmer.com/news-releases/news-release-details/perkinelmer-acquire-caliper-life-sciences-approximately-600>;
- 121 Source documents held by Recorded Future.
- 122 User's Manual for Nuance 3.0.2.
- 123 Lu Junyu [卢俊宇], "10th China International Exhibition of Police Equipment Held in Beijing" [第十届中国国际警用装备博览会在京举办], Xinhua Net [新华网], November 23, 2020, <https://archive.ph/jk2JL>.
- 124 "Chongqing General Aviation Group Participates in 10th China International Exhibition of Police Equipment" [重庆通航集团参加第十届中国国际警用装备博览会], Xinhua Net [新华网], November 23, 2020, <https://archive.ph/f1Zja>.
- 125 Lu, "10th China International Exhibition of Police Equipment Held in Beijing"; Xia Yifang [夏一方], "8th China International Exhibition of Police Equipment Held in Beijing" [第八届中国国际警用装备博览会在京举行], China Military Net [中国军网], May 17, 2016, <https://archive.ph/wqakC>; "Each Country's Police Weapons Makes Public Appearances at China International Exhibition of Police Equipment" [各国警用武器亮相中国国际警用装备博览会], Sina [新浪], June 25, 2004, <https://archive.ph/kADcr>.
- 126 The exhibitor is Ryan Technologies. For more information about this company, see the Third-Party Companies section below.
- 127 "2014 China Police Expo (CIEPE) Quickly Approaching", Ryan Technologies, April 30, 2014, <https://archive.ph/jcA3O>.
- 128 "Xi'an Traffic Police Hard Science and Technology 'City Brain Command Center' Revealed at 10th China International Exhibition of Police Equipment" [西安交警硬科技"城市大脑指挥中心"亮相第十届中国警博会], Xinhua Net [新华网], November 24, 2020, <https://archive.ph/006bX>.

- 129 We counted each time that a given company has participated in CIEPE as an instance. For example, if a company participated in 5 different years of CIEPE, that company generated 5 instances.
- 130 Our list almost certainly does not include every US-linked company that has ever participated in CIEPE.
- 131 “Our Company”, Ryan Technologies, <https://archive.ph/LK2eM>; “Contact Us”, Ryan Technologies, <https://archive.ph/xW319>.
- 132 “Our Company”, Ryan Technologies.
- 133 “Our Company”, Ryan Technologies.
- 134 “Our Company”, Ryan Technologies.
- 135 “Our Company”, Ryan Technologies.
- 136 “Our Team”, Ryan Technologies, <https://archive.ph/UMSAT>.
- 137 “FAQ”, Ryan Technologies, <https://archive.ph/nheq4>.
- 138 “Prospective Partners”, Ryan Technologies.
- 139 “Contact Us”, Ryan Technologies.
- 140 “Prospective Partners”, Ryan Technologies, <https://archive.ph/ukjPU>.
- 141 Corporate records obtained from the California Secretary of State show that E.C. Ryan International, Inc. was incorporated in February 1992 as a “consulting services” business. Likewise, E.C. Ryan International, Inc.’s “street address of principal executive office” and its “street address of principal business office” are both the same Santa Barbara address provided on Ryan Technologies’ website. The corporate filings also identify this address as the address of Eric C. Ryan, who is the chief executive officer, director, and president of E.C. Ryan International, Inc. Older archived versions of the “www[.]ecryan[.]com” domain direct to a website for E.C. Ryan International, Inc., describing it as a company that “offers a technically competent and highly motivated marketing, sales and technical service team to open the market for western equipment and technology in the People’s Republic of China”. More recent archived versions of “www[.]ecryan[.]com” redirect to Ryan Technologies’ website (www[.]ryansecuritytech[.]com), and the “www[.]ecryan[.]com” URL currently redirects to the website of Resonant Ltd. (www[.]resonantltd[.]com). See “E.C. Ryan International, Inc.”, OpenCorporates, https://opencorporates.com/companies/us_ca/C1814992; “E.C. Ryan International, Inc.”, E.C. Ryan International, Inc., <https://web.archive.org/web/20090615073807/http://ecryan.com/>; “Resonant”, Resonant, <https://archive.ph/kBxkl>; Source documents held by Recorded Future.
- 142 Resonant Ltd.’s website describes the company as “formerly Ryan Security Technology”, provides the same “805-962-3080” contact phone number as found on Ryan Technologies’ website, and provides the same Santa Barbara address found on Ryan Technologies’ website and in E.C. Ryan International, Inc.’s corporate filings. Likewise, Eric C. Ryan’s social media account(s) lists him as the “Founder/President” of “Resonant Ltd (China)”, describing the company as “value-add distributor of western public security and forensic technology to the People’s Republic of China”. 1 such profile further states that “the company manages sales and distribution for its clients selling into China and offers product integration, localization, customer training and after-sale service” and that “E.C. Ryan International, Inc is a US C-Corp supporting the operations of Resonant Ltd”. Resonant’s website also lists many of the same clients or partners identified on Ryan Technologies’ website. Recorded Future identified a “Resonant Limited” that was registered in Hong Kong in March 2017, though we could not confirm whether this entity is the Resonant Ltd. that replaced Ryan Technologies. Resonant Ltd. claims to have launched its new website in January 2018, and “www[.]ecryan[.]com” had begun redirecting to “www[.]resonantltd[.]com” by at least June 2018. See “About”, Resonant, <https://archive.ph/zFXqA>; “Resonant”, Resonant; “Contact Us”, “Clients”, Resonant, <https://archive.ph/duf46>; Ryan Technologies; “www.resonantltd.com”, ICANN, <https://lookup.icann.org/lookup?q=www.resonantltd.com&t=a>; Source documents held by Recorded Future.
- 143 Beijing Ryan Wende Science and Technology Co., Ltd. has several shareholders, all of whom are individuals. The website of Beijing Ryan Wende Science and Technology Co., Ltd. has “Ryan Technologies” branding and its URL (www[.]ecryan[.]com[.]cn) appears to be a reference to E.C. Ryan International, Inc or Eric C. Ryan. The website’s US flag button directs to “www[.]ecryan[.]com”, which now redirects to Resonant Ltd.’s website (www[.]resonantltd[.]com). Beijing Ryan Wende Science and Technology Co., Ltd.’s address is the same as the Beijing address listed on Ryan Technologies’ website. Moreover, the company’s website states that Beijing Ryan Wende Science and Technology Co., Ltd. was established in 1992; is headquartered in Beijing; has branches in Shanghai, Chengdu, Shenyang, Wuhan, and Guangzhou; has 30 maintenance stations across China; and has an agent organization in the US. See “Ryan Company” [瑞源公司], Beijing Ryan Wende Science and Technology Co., Ltd. [北京瑞源文德科技有限公司], <https://archive.ph/KGV8k>; “Resonant”, Resonant; “Contact Us” [联系我们], Beijing Ryan Wende Science and Technology Co., Ltd. [北京瑞源文德科技有限公司], <https://archive.ph/QWc6M>; “Company Introduction” [公司介绍], Beijing Ryan Wende Science and Technology Co., Ltd. [北京瑞源文德科技有限公司], <https://archive.ph/tKtTS>; “Development Course” [发展历程], Beijing Ryan Wende Science and Technology Co., Ltd., <https://archive.ph/HPUHv>; Source documents held by Recorded Future.
- 144 The “English” option on Beijing Ryan Huade Science and Technology Co., Ltd.’s website (ruiyuanhd[.]com) directs to “www[.]ecryan[.]com”, which now redirects to Resonant Ltd.’s website (www[.]resonantltd[.]com). The shareholders and officers of Beijing Ryan Huade Science and Technology Co., Ltd. appear to overlap with those of Beijing Ryan Wende Science and Technology Co., Ltd. A January 2014 post on Beijing Ryan Huade Science and Technology Co., Ltd.’s website states that “Ryan Company” (瑞源公司) was registered to participate in the 7th CIEPE in 2014; we observed evidence of “Ryan Security Technologies, Ltd.” (瑞源国际安全技术公司; Ryan International Security Technology Co.) participating in the 7th CIEPE (see Appendix C). According to its website, Beijing Ryan Huade Science and Technology Co., Ltd. specializes in introducing “advanced foreign” active anti-counterfeiting, security inspection, electronic data recovery and analysis, and criminal investigation equipment. It has sales personnel and facilities across China, including in Xinjiang. The company claims to sell and service products from companies in the US, Canada, the UK, Italy, Israel, and other countries, and its website identifies numerous foreign partners. See “Ryan Huade” [瑞源华德], Ryan Huade [瑞源华德], <https://archive.ph/bKYLQ>; “Ryan Company Will Participate in ‘2014 7th China International Exhibition of Police Equipment’” [瑞源公司将参加“2014第七届中国国际警用装备博览会”], Ryan Huade [瑞源华德], January 17, 2014, <https://archive.ph/C0Xqf>; “Cooperation Partners” [合作伙伴], Ryan Huade [瑞源华德], <https://archive.ph/3O75b>; “Company Introduction” [公司介绍], Ryan Huade [瑞源华德], <https://archive.ph/QT26I>; Source documents held by Recorded Future.
- 145 “5th China International Exhibition of Police Equipment Floor Plan” [第五届中国国际警用装备博览会展位图], cpexhibition.com, <https://archive.ph/iIJWc>.
- 146 “Company Qualifications” [公司资质] Beijing Ryan Wende Science and Technology Co., Ltd. [北京瑞源文德科技有限公司], <https://archive.ph/mWU0x>.
- 147 Upon communication with Rapiscan, Rapiscan has confirmed it has a current distribution agreement in place with Ruiyuan Wende Technologies (China), Ltd. (and affiliated companies) to distribute Rapiscan’s X-ray and ion mobility spectrometry equipment in China. Rapiscan has stated that it is not a partner of Ryan Technologies, and does not offer digital forensics products of any type. Recorded Future analysis suggests that “Ruiyuan Wende Technologies (China), Ltd.” referenced by Rapiscan is likely an alternate transliteration Beijing Ryan [Ruiyuan] Wende Science and Technology Co., Ltd.
- 148 “Cooperation Partners” [合作伙伴], Beijing Ryan Wende Science and Technology Co., Ltd. [北京瑞源文德科技有限公司], <https://archive.ph/hHQYt>.
- 149 Specifically: Oxygen Forensics, BlackBag Technologies, Elcomsoft, Logicube, and AccessData. Cellebrite (which acquired BlackBag) announced in October 2020 that it was halting sales in Hong Kong and China, but reporters have claimed that Chinese law enforcement entities are still purchasing the company’s products through third-party resellers and brokers. See “Cellebrite to Stop Selling Its Digital Intelligence Offerings in Hong Kong & China”, October 7, 2020, <https://cellebrite.com/en/cellebrite-to-stop-selling-its-digital-intelligence-offerings-in-hong-kong-china/>; Mara Hvistendahl, “Chinese Police Kept Buying Cellebrite Phone Crackers After Company Said It Ended Sales”, The Intercept, August 26, 2021, <https://theintercept.com/2021/08/26/cellebrite-china-cellphone-hack/>; “Cellebrite Acquires BlackBag Technologies”, Cellebrite, January 15, 2020, <https://cellebrite.com/en/cellebrite-acquires-blackbag-technologies/>.

- 150 Hvistendahl, "Chinese Police Kept Buying Cellebrite Phone Crackers After Company Said It Ended Sales".
- 151 Source documents held by Recorded Future.
- 152 Source documents held by Recorded Future.
- 153 Source documents held by Recorded Future.
- 154 Also known as the city's criminal investigation zongdui (刑事侦查总队). "Tianjin City Former Deputy Ninghe District Head Liu Yushun Receives Investigation" [天津市宁河区副区长刘玉顺接受审查调查], Central Commission for Discipline Inspection Net [中央纪委国家监委网站], <https://archive.ph/pqvs2>.
- 155 "IntegenX by Thermo Fisher Scientific RapidHIT Instrument and Consumables", Thermo Fisher Scientific, <https://www.thermofisher.com/us/en/home/industrial/forensics/human-identification/forensic-dna-analysis/dna-analysis/rapidhit-id-system-human-identification/rapidhit-id-system-crime-labs/integenx-by-thermo-fisher-scientific-rapidhit.html>.
- 156 For more information about Thermo Fisher Scientific's business with Chinese public security entities, see the Local Subsidiaries section.
- 157 Thermo Fisher Scientific's website states that Invitrogen (Shanghai) Trading Co., Ltd. is a wholly-owned subsidiary of Thermo Fisher Scientific. Thermo Fisher Scientific's website also hosts a copy of Invitrogen (Shanghai) Trading Co., Ltd.'s Chinese business license, which shows that the company is located in Shanghai, that the company is a wholly foreign-owned enterprise, and that it was founded in April 2006. Other corporate records confirm that Invitrogen (Shanghai) Trading Co., Ltd. was founded in April 2006 and indicate that its sole shareholder is Invitrogen Holdings LLC. Invitrogen acquired Applied Biosystems in 2008, forming Life Technologies Corporation. Thermo Fisher Scientific acquired Life Technologies Corporation in 2014. Prior to the creation of Life Technologies Corporation, Applied Biosystems had participated in CIEPE (see Appendix C). "From February 19, 2010, [Invitrogen (Shanghai) Trading Co., Ltd.] and Thermo Fisher Scientific's Website Products Will Synchronously Expand" [从2019年2月18日开始【英潍捷基(上海)贸易有限公司】和赛默飞官网产品将同步扩展], Thermo Fisher Scientific, February 18, 2019, <https://archive.ph/WwRB1>; "Contact us", Thermo Fisher Scientific, <https://corporate.thermofisher.com/us/en/index/contact-us.html>; "Business License" [营业执照], Thermo Fisher Scientific, <https://archive.ph/yqeVP>; "Invitrogen and Applied Biosystems Complete Merger", [analytica-world.com](https://www.analytica-world.com), November 25, 2008, <https://www.analytica-world.com/en/news/90176/invitrogen-and-applied-biosystems-complete-merger.html>; Lewis Krauskopf and Toni Clarke, "Invitrogen to buy Applied Biosystems for \$6.7 bln", Reuters, June 12, 2008, <https://www.reuters.com/article/us-appliedbio-invirogen-id1NWNAS808020080612>; Thermo Fisher Scientific Completes Acquisition of Life Technologies Corporation", Thermo Fisher Scientific, February 3, 2014, <https://www.thermofisher.com/se/en/home/about-us/news-gallery/press-releases/2014/thermo-fisher-scientific-completes-acquisition-of-life-technologies-corporation.html>.
- 158 Source documents held by Recorded Future.
- 159 "Business License", Thermo Fisher Scientific.
- 160 "About", Thermo Fisher Scientific, <https://corporate.thermofisher.com/us/en/index/about.html>.
- 161 Sui-Lee Wee, "China Uses DNA to Track Its People, With the Help of American Expertise", The New York Times, February 21, 2019, <https://www.nytimes.com/2019/02/21/business/china-xinjiang-uyghur-dna-thermo-fisher.html>.
- 162 Lee, "China Uses DNA to Track Its People".
- 163 Sui-Lee Wee, "China Still Buys American DNA Equipment for Xinjiang Despite Blocks", The New York Times, June 11, 2021, <https://www.nytimes.com/2021/06/11/business/china-dna-xinjiang-american.html>.
- 164 Source documents held by Recorded Future.
- 165 Source documents held by Recorded Future.
- 166 Source documents held by Recorded Future.
- 167 As discussed in a previous note, Invitrogen acquired Applied Biosystems and then formed Life Technologies Corporation, which was later acquired by Thermo Fisher Scientific.
- 168 Source documents held by Recorded Future.
- 169 Source documents held by Recorded Future.
- 170 Source documents held by Recorded Future.
- 171 Source documents held by Recorded Future.
- 172 "3130 Genetic Analyzer (factory refurbished)", Thermo Fisher Scientific, <https://www.thermofisher.com/order/catalog/product/3130XLR>.
- 173 Source documents held by Recorded Future.
- 174 Enstrom Helicopter Corporation announced bankruptcy in early 2022, though later reports suggest that the company has now been acquired by US-based Surack Enterprises. Enstrpm's post-bankruptcy relationship with CGAG is unclear. "Enstrom Helicopter files for bankruptcy", Vertical, January 20, 2022, <https://verticalmag.com/news/enstrom-helicopter-files-for-bankruptcy/>; Alyssa Jawor, "New owner to reopen former Enstrom Helicopter Facility", Upper Michigan Source, March 9, 2022, <https://www.uppermichiganssource.com/2022/03/09/new-owner-re-open-former-enstrom-helicopter-facility/>; "Enstrom Rescued From Bankruptcy By MidTex Aviation", Aviation Week, March 10, 2022, <https://aviationweek.com/business-aviation/enstrom-rescued-bankruptcy-midtex-aviation/>; "Enstrom Helicopter Under New and Stable Ownership", GlobeNewswire, May 13, 2022, <https://www.globenewswire.com/news-release/2022/05/14/2443329/0/en/Enstrom-Helicopter-Under-New-and-Stable-Ownership.html>.
- 175 "Made in Chongqing" Helicopter First Domestic On-Market Sales" ["重庆造"直升机首次在国内上市销售], China Government Net [中央政府门户网站], May 17, 2013, <https://archive.ph/Js0E2>.
- 176 "Enstrom Helicopter Corporation", Enstrom Helicopter Corporation, <https://enstromhelicopter.com/>.
- 177 "About Us", Enstrom Helicopter Corporation, <https://enstromhelicopter.com/about/>.
- 178 "Enstrom targets China with parent company CGAG", Vertical, November 13, 2014, <https://verticalmag.com/news/enstromtargetschinawithparentcompanycgag/>.
- 179 "Enstrom Helicopter Acquires New Owner", Enstrom Helicopter Corporation, January 8, 2013, <https://enstromhelicopter.com/2013/01/enstrom-helicopter-acquires-new-owner/>; "10th China International Exhibition on Police Equipment", CIEPE, <https://cloud.ciepe.com/topnews/huikan2020.html>; "Chongqing Helicopter Industry Investment Co., Ltd." [重庆直升机产业投资有限公司], China Aviation Talent Net [中国航空英才网], <https://archive.ph/GZYGR>; "Dealers & Reps - Asia", Enstrom Helicopter Corporation, <https://enstromhelicopter.com/support/dealers/asia/>.
- 180 Source documents held by Recorded Future.
- 181 10th China International Exhibition on Police Equipment", CIEPE.
- 182 "Chongqing General Aviation Group Participates in 10th China International Exhibition of Police Equipment".
- 183 "Enstrom targets China with parent company CGAG".
- 184 "Enstrom targets China with parent company CGAG".
- 185 "Enstrom targets China with parent company CGAG".
- 186 "Enstrom targets China with parent company CGAG".
- 187 "Chongqing City 2014 City-Level Key Projects List" [重庆市2014年市级重点项目名单], Chongqing City Development and Reform Commission [重庆市发展和改革委员会], <http://zfggw.cq.gov.cn/zwx/bmdt/202002/P020200212597945858719.doc>.

- 188 "Chongqing General Aviation Group Participates in 10th China International Exhibition of Police Equipment".
- 189 "Chongqing General Aviation Group Participates in 10th China International Exhibition of Police Equipment".
- 190 "Chongqing General Aviation Group Participates in 10th China International Exhibition of Police Equipment".
- 191 "10th China International Exhibition on Police Equipment", CIEPE.
- 192 "10th China International Exhibition on Police Equipment", CIEPE.
- 193 "10th China International Exhibition on Police Equipment", CIEPE.
- 194 "10th China International Exhibition on Police Equipment", CIEPE; "Chongqing General Aviation Group Participates in 10th China International Exhibition of Police Equipment".
- 195 "Chongqing General Aviation Group Participates in 10th China International Exhibition of Police Equipment".
- 196 Source documents held by Recorded Future.
- 197 Source documents held by Recorded Future.
- 198 Source documents held by Recorded Future.
- 199 "Chongqing Helicopter Industry Investment Co., Ltd.", China Aviation Talent Net; "Company Introduction" [公司简介], Chongqing General Aviation Co., Ltd. [重庆通用航空有限公司], <https://archive.ph/bxS5k>.
- 200 Source documents held by Recorded Future.
- 201 Source documents held by Recorded Future.
- 202 "Ministry of Public Security Police Aviation Office and Chongqing General Aviation Group Sign Strategic Cooperation Agreement in Tianjin" [公安部警航办与重庆通航集团在津签署战略合作协议], China National Radio Net [央广网], September 15, 2017, <https://archive.ph/NjEpk>.
- 203 "Ministry of Public Security Police Aviation Office and Chongqing General Aviation Group Sign Strategic Cooperation Agreement in Tianjin".
- 204 Talent flows are a form of technology transfer because, as the Center for Security and Emerging Technology notes, "at its core, 'technology transfer' simply refers to the exchange of information and ideas related to science and technology". Ryan Fedasiuk and Emily Weinstein, Overseas Professionals and Technology Transfer to China (CSET, 2020), <https://cset.georgetown.edu/publication/overseas-professionals-and-technology-transfer-to-china>. See also Emily S. Weinstein, "Chinese Talent Program Tracker", CSET, November 2020, <https://cset.georgetown.edu/publication/chinese-talent-program-tracker/>; Anna B. Puglisi, "Chinese Students, Scholarship, and US Innovation" in China's Quest for Foreign Technology, eds. Hannas and Tatlow; Alex Joske and Jeffrey Stoff, "The United Front and Technology Transfer" in China's Quest for Foreign Technology, eds. Hannas and Tatlow.
- 205 Peterson, "Foreign Technology and the Surveillance State".
- 206 "Third Institute Introduction" [三所简介], MPS Third Research Institute [公安部第三研究所], <https://web.archive.org/web/20200617091924/https://hr.trimps.ac.cn/introduction.jhtml>.
- 207 "Third Institute Introduction".
- 208 "Third Institute Introduction".
- 209 "Third Institute Introduction".
- 210 "Third Institute Introduction".
- 211 "Company Profile" [企业概况], Beijing Run Technologies Co., Ltd. [北京锐安科技有限公司], <https://archive.ph/0ogBE>.
- 212 "Third Institute Introduction"; "Organizational Structure" [组织架构], MPS Third Research Institute [公安部第三研究所], <https://web.archive.org/web/20200617173255/http://hr.trimps.ac.cn/structure.jhtml>.
- 213 Source documents held by Recorded Future.
- 214 Source documents held by Recorded Future.
- 215 We confirmed this information via the individual's published writings and other such sources. Source documents held by Recorded Future.
- 216 The individual claims this on an online resume. Source documents held by Recorded Future.
- 217 The individual claims this on an online resume. Source documents held by Recorded Future.
- 218 The individual claims this on an online resume. Source documents held by Recorded Future.
- 219 The individual claims this on an online resume. Source documents held by Recorded Future.
- 220 The individual claims this on an online resume. Source documents held by Recorded Future.
- 221 We confirmed this information via the individual's published writings and other such sources. Source documents held by Recorded Future.
- 222 The individual claims this on an online resume. Source documents held by Recorded Future.
- 223 The individual claims this on an online resume. Source documents held by Recorded Future.
- 224 The individual claims this on an online resume. Source documents held by Recorded Future.
- 225 The individual claims this on an online resume. Source documents held by Recorded Future.
- 226 The individual claims this on an online resume. Source documents held by Recorded Future.
- 227 The individual claims this on an online resume. Source documents held by Recorded Future.
- 228 The individual claims this on an online resume. Source documents held by Recorded Future.
- 229 The individual claims this on an online resume. Source documents held by Recorded Future.
- 230 The individual claims this on an online resume. Source documents held by Recorded Future.
- 231 Mara Hvistendahl, "How Oracle Sells Repression in China", The Intercept, February 18, 2021, <https://theintercept.com/2021/02/18/oracle-china-police-surveillance/>; Mara Hvistendahl, "How a Chinese Surveillance Broker Became Oracle's 'Partner of the Year'", The Intercept, April 22, 2021, <https://theintercept.com/2021/04/22/oracle-digital-china-resellers-brokers-surveillance/>; Mara Hvistendahl, "Oracle Boasted That Its Software Was Used Against U.S. Protesters. Then It Took the Tech to China.", The Intercept, May 25, 2021, <https://theintercept.com/2021/05/25/oracle-social-media-surveillance-protests-endeca/>; Mara Hvistendahl, "Oracle Executive's Interview with Reporter He Sought Dirt On", The Intercept, April 30, 2021, <https://theintercept.com/2021/04/30/oracle-china-ken-glueck/>; Valentin Weber and Vasilis Ververis, China's Surveillance State: A Global Project (Top10VPN, August 2021), <https://www.top10vpn.com/assets/2021/07/Chinas-Surveillance-State.pdf>; Lin and Chin, "U.S. Tech Companies Prop Up China's Vast Surveillance Network"; Walton, China's Golden Shield; Peterson, "Foreign Technology and the Surveillance State".
- 232 For a sample of our findings relevant to Xinjiang, see the Case Study: Hard Disk Drives in the Xinjiang Uyghur Autonomous Region section of this report. In Tibet, we observed various public security entities using US database technology, including for surveillance and population management systems, among other examples. Source documents held by Recorded Future.
- 233 Source documents held by Recorded Future.
- 234 Source documents held by Recorded Future.

- 235 Source documents held by Recorded Future.
- 236 Source documents held by Recorded Future.
- 237 "IBM Contact", IBM, <https://www.ibm.com/contact/us/en/?lnk=flg-cont-usen>.
- 238 Weber and Ververis, China's Surveillance State.
- 239 "HP Partners with Tsinghua to Create a Chinese Technology Powerhouse", HP, May 21, 2015, <https://www.hp.com/us-en/hp-news/press-release.html?id=1993680&pageTitle=HP-Partners-with-Tsinghua-to-Create-a-Chinese-Technology-Powerhouse>; "Hewlett Packard Enterprise/ New H3C delivers double digit market share and attains number one position in second quarter of 2019 worldwide server revenue tracker", HPE, September 17, 2019, <https://www.hpe.com/us/en/newsroom/press-release/2019/09/hewlett-packard-enterprise-new-h3c-delivers-double-digit-market-share-and-attains-number-one-position-in-second-quarter-of-2019-worldwide-server-revenue-tracker.html>.
- 240 "HP Partners with Tsinghua to Create a Chinese Technology Powerhouse"; "Overview", Tsinghua Holdings, <https://archive.ph/DSqo9>; Che Pan, "China's Tsinghua University to cut off debt-laden investment arm, giving it away to Sichuan's state asset watchdog", South China Morning Post, April 19, 2022, <https://www.scmp.com/tech/big-tech/article/3174794/chinas-tsinghua-university-cut-debt-laden-investment-arm-giving-it>.
- 241 "HP History Timeline", HPE, <https://www.hpe.com/us/en/about/history/timeline-growth.html>.
- 242 "HP Partners with Tsinghua to Create a Chinese Technology Powerhouse".
- 243 "Hewlett Packard Enterprise/ New H3C delivers double digit market share".
- 244 Lin and Chin, "U.S. Tech Companies Prop Up China's Vast Surveillance Network".
- 245 "Contact Cisco", Cisco, <https://www.cisco.com/c/en/us/about/contact-cisco.html>.
- 246 Sarah Lai Stirland, "Cisco Leak: 'Great Firewall' of China Was a Chance to Sell More Routers", Wired, May 28, 2008, <https://www.wired.com/2008/05/leaked-cisco-do/>; Weber and Ververis, China's Surveillance State.
- 247 "Comtech", Comtech, <https://www.comtech.com/>.
- 248 "About the Company", Comtech EF Data, <https://www.comtechefdata.com/about/>; "Contact Us", Comtech EF Data, <https://www.comtechefdata.com/contact-us>.
- 249 Zoe Haver, "Unmasking China's Maritime Militia", Radio Free Asia, May 17, 2021, <https://www.rfa.org/english/news/special/maritime-militia/>.
- 250 "Motorola to Officially Split into Two Firms Tuesday", CNBC, January 3, 2011, <https://www.cnb.com/id/40897532>.
- 251 "Motorola Solutions", LinkedIn, <https://www.linkedin.com/company/motorolasolutions/>; "Office Locations", Motorola Solutions, https://www.motorolasolutions.com/en_us/about/company-overview/office-locations.html.
- 252 "Motorola eyes Greater China after winning HK police mobile contract", South China Morning Post, March 27, 2003, <https://www.scmp.com/article/410666/motorola-eyes-greater-china-after-winning-hk-police-mobile-contract>.
- 253 "QB" almost certainly refers to "intelligence" (qingbao; 情报).
- 254 Source documents held by Recorded Future.
- 255 Source documents held by Recorded Future.
- 256 Source documents held by Recorded Future.
- 257 See the State Violence section of this report for further discussion. "Ministry of Public Security Holds Whole Country 'Golden Shield Project' Second Phase Work Conference; "Ministry of Public Security: Public Security Science and Technology Informatization Construction and Application 4 Highlights Emerge".
- 258 According to Human Rights Watch, "key persons" (重点人员) means "important persons to be controlled" and refers to "individuals deemed to pose a potential threat to society, so that officials and police should monitor or 'control' their movements and behavior especially closely; similar to profiling". Such individuals can include "persons involved in terrorism, persons involved in stability, persons involved with drugs, fugitive persons [zaitiao ren yuan], persons previously convicted of major crimes, trouble-making mentally ill persons, and petitioners", as well as possible political and religious dissidents. See "Tibet: A Glossary of Repression", Human Rights Watch, June 19, 2017, <https://www.hrw.org/video-photos/interactive/2017/06/20/tibet-glossary-repression>.
- 259 Source documents held by Recorded Future.
- 260 Source documents held by Recorded Future.
- 261 Schwarck, "Behind the Golden Shield".
- 262 Source documents held by Recorded Future.
- 263 Source documents held by Recorded Future.
- 264 Source documents held by Recorded Future.
- 265 Source documents held by Recorded Future.
- 266 Source documents held by Recorded Future.
- 267 Source documents held by Recorded Future.
- 268 Source documents held by Recorded Future.
- 269 Source documents held by Recorded Future.
- 270 "'Golden Shield Project' First Phase Construction Basically Complete".
- 271 Source documents held by Recorded Future.
- 272 Source documents held by Recorded Future.
- 273 Source documents held by Recorded Future.
- 274 Source documents held by Recorded Future.
- 275 Source documents held by Recorded Future.
- 276 Source documents held by Recorded Future.
- 277 Source documents held by Recorded Future.
- 278 Source documents held by Recorded Future.
- 279 Source documents held by Recorded Future.
- 280 Source documents held by Recorded Future.
- 281 Source documents held by Recorded Future.
- 282 Source documents held by Recorded Future.
- 283 Source documents held by Recorded Future.
- 284 Source documents held by Recorded Future.
- 285 Source documents held by Recorded Future.

286 Source documents held by Recorded Future.

287 Source documents held by Recorded Future.

288 Source documents held by Recorded Future.

289 Source documents held by Recorded Future.

290 Source documents held by Recorded Future.

291 Source documents held by Recorded Future.

292 Source documents held by Recorded Future.

293 Source documents held by Recorded Future.

294 Rajagopalan, Killing, and Buschek, "China Secretly Built A Vast New Infrastructure To Imprison Muslims"; Xu, Cave, Leibold, Munro, and Ruser, Uyghurs for sale; Wang, "China's Algorithms of Repression"; "China cuts Uighur births with IUDs, abortion, sterilization", Associated Press, June 29, 2020, <https://apnews.com/article/ap-top-news-international-news-weekend-reads-china-health-269b3de1af34e17c1941a514f78d764c>.

295 "Seagate Technology LLC Headquarters", Seagate, August 18, 2017, <https://www.seagate.com/files/www-content/about/global-citizenship/en-us/docs/seagate-hq-iso9001-2008-17019-08-18-17.pdf>; "Office Locations", Western Digital, <https://www.westerndigital.com/company/office-locations>

296 Lin and Chin, "U.S. Tech Companies Prop Up China's Vast Surveillance Network".

297 Lin and Chin, "U.S. Tech Companies Prop Up China's Vast Surveillance Network".

298 Source documents held by Recorded Future.

299 Source documents held by Recorded Future.

300 Source documents held by Recorded Future.

301 Source documents held by Recorded Future.

302 Source documents held by Recorded Future.

303 Source documents held by Recorded Future.

304 "SkyHawk Surveillance", Seagate, 2018, https://www.seagate.com/www-content/datasheets/pdfs/skyhawk-3-5-hdd-DS1902-8-1803US-en_US.pdf.

305 "SkyHawk Surveillance".

306 "SkyHawk Surveillance".

307 "Dahua Provides 'Uyghur Warnings' To China Police", IPVM, February 9, 2021, <https://ipvm.com/reports/dahua-uyghur-warning>; Charles Rollet, "In China's Far West, Companies Cash in on Surveillance Program That Targets Muslims", Foreign Policy, June 13, 2018, <https://foreignpolicy.com/2018/06/13/in-chinas-far-west-companies-cash-in-on-surveillance-program-that-targets-muslims/>.

308 Charles Rollet, "Uniview Racist Uyghur Recognition Revealed", IPVM, November 16, 2020, <https://ipvm.com/reports/uniview-uyghur>.

309 Source documents held by Recorded Future.

310 Source documents held by Recorded Future.

311 Source documents held by Recorded Future.

312 Source documents held by Recorded Future.

313 Source documents held by Recorded Future.

314 Donald H. McMillen, "Xinjiang and the Production and Construction Corps: A Han Organisation in a Non-Han Region", The Australian Journal of Chinese Affairs 6 (1981), <https://www.jstor.org/stable/2159052>.

315 "Full Text: The History and Development of the Xinjiang Production and Construction Corps", Sina, October 5, 2014, <https://web.archive.org/web/20141011205642/http://english.sina.com/china/2014/1004/742790.html>; Alexa Oleson, "China's Vast, Strange, and Powerful Farming Militia Turns 60", Foreign Policy, October 8, 2014, <https://foreignpolicy.com/2014/10/08/chinas-vast-strange-and-powerful-farming-militia-turns-60/>.

316 "The History and Development of the Xinjiang Production and Construction Corps".

317 Irina Bukharin, Long Shadows: How the Global Economy Supports Oppression in Xinjiang (C4ADS, 2021), <https://c4ads.org/long-shadows>; "Treasury Sanctions Chinese Entity and Officials Pursuant to Global Magnitsky Human Rights Executive Order", US Department of the Treasury, July 31, 2020, <https://home.treasury.gov/news/press-releases/sm1073>; Laura T. Murphy, Nyrola Elimä, and David Tobin, Until Nothing is Left: China's Settler Corporation and its Human Rights Violations in the Uyghur Region: A report on the Xinjiang Production and Construction Corps (Helena Kennedy Centre for International Justice, 2022), <https://www.shu.ac.uk/helena-kennedy-centre-international-justice/research-and-projects/all-projects/until-nothing-is-left>.

318 Source documents held by Recorded Future.

319 Source documents held by Recorded Future.

320 "First Division Aral Prison (第一师阿拉尔监狱)", Xinjiang Victims Database, <https://shahit.biz/eng/#facilities96>.

321 Source documents held by Recorded Future.

322 Source documents held by Recorded Future.

323 "Third Division Gemilik Prison (第三师盖米里克监狱)", Xinjiang Victims Database, <https://shahit.biz/eng/#facilities101>.

324 Hvistendahl, "Oracle Boasted That Its Software Was Used Against U.S. Protesters".

325 Alice Speri, "The NYPD Is Using Drones the U.S. Government Claims Threaten National Security", The Intercept, October 12, 2021, <https://theintercept.com/2021/10/12/nypd-chinese-drones-surveillance/>; Dan Gettinger, Public Safety Drones, 3rd Edition (Center for the Study of the Drone at Bard College, 2020), <https://dronecenter.bard.edu/projects/public-safety-drones-project/public-safety-drones-3rd-edition/>; Cate Cadell, "Drone company DJI obscured ties to Chinese state funding, documents show", Washington Post, February 1, 2022, <https://www.washingtonpost.com/national-security/2022/02/01/china-funding-drones-dji-us-regulators/>.

326 Unmanned Aircraft Systems: Impact and Use Policy (New York Police Department, 2021), https://www1.nyc.gov/assets/nypd/downloads/pdf/public_information/post-final/unmanned-aircraft-systems-uas-nypd-impact-and-use-policy_4.9.21_final.pdf;

327 Speri, "The NYPD Is Using Drones the U.S. Government Claims Threaten National Security"; Zolan Kanno-Youngs, "U.S. Watched George Floyd Protests in 15 Cities Using Aerial Surveillance", The New York Times, June 19, 2020, <https://www.nytimes.com/2020/06/19/us/politics/george-floyd-protests-surveillance.html>; Nicol Turner Lee and Caitlin Chin, "Police surveillance and facial recognition: Why data privacy is imperative for communities of color", Brookings, April 12, 2022, <https://www.brookings.edu/research/police-surveillance-and-facial-recognition-why-data-privacy-is-an-imperative-for-communities-of-color/>.

328 Jonathan Hillman, "China is Watching You", The Atlantic, October 18, 2021, <https://www.theatlantic.com/ideas/archive/2021/10/china-america-surveillance-hikvision/620404/>; Conor Healy, "US Military & Gov't Break Law, Buy Banned Dahua/Lorex, Congressional Committee Calls For Investigation", IPVM, December 1, 2021, <https://ipvm.com/reports/usg-lorex>.

- 329 Atha et al., China's Smart Cities Development; Steven Feldstein, The Global Expansion of AI Surveillance (Carnegie Endowment for International Peace, 2019, <https://carnegieendowment.org/2019/09/17/global-expansion-of-ai-surveillance-pub-79847>; The Global Surveillance Industry (Privacy International, 2016), https://www.privacyinternational.org/sites/default/files/2017-12/global_surveillance_0.pdf).
- 330 "Loyal Teachers Undertake a Sacred Mission, Public Security Invincible Army Writes a New Chapter".
- 331 China Police Daily, <http://epaper.cpd.com.cn>.
- 332 "PRC Ministry of Public Security" [中华人民共和国公安部], <https://www.mps.gov.cn/>.
- 333 "PRC Ministry of Public Security".
- 334 Lulu and Jirouš, Back to the Cheka.
- 335 Lulu and Jirouš, Back to the Cheka.
- 336 Special Equipment Net [特种装备网], "10th Ministry of Public Security Police Exhibition 600+ Participating Businesses Came! How Many Are you Familiar With?" [第十届公安部警博会600多家参展商名单来了! 都有哪些你熟悉的?], Sohu [搜狐], November 30, 2020, <https://archive.ph/RxkR9>; "10th China International Exhibition on Police Equipment", CIEPE.
- 337 "FLIR Detection", FLIR Detection, <https://www.flirdetection.com/>.
- 338 "FLIR Systems Inc", Bloomberg, <https://www.bloomberg.com/profile/company/FLIR:US>.
- 339 "About Teledyne FLIR", Teledyne FLIR, <https://www.flir.com/about/about-flir/>.
- 340 "Teledyne to Acquire FLIR Systems", Teledyne, January 4, 2021, <https://www.flir.com/news-center/corporate-news/teledyne-to-acquire-flir-systems/>; "Teledyne FLIR Company History", Teledyne FLIR, <https://www.flir.com/about/company-history/>; "About Us", Teledyne Technologies, <https://www.teledyne.com/who-we-are/about-us>.
- 341 "About", Promega, <https://worldwide.promega.com/aboutus/company-information/>.
- 342 "About Guth Labs", Guth Laboratories, Inc., <https://www.guthlabs.com/about/>.
- 343 "About Guth Labs", Guth Laboratories, Inc.
- 344 "About Tricol", Tricol Biomedical Inc., <https://tricolbiomedical.com/about-tricol/>.
- 345 "About Tricol", Tricol Biomedical Inc.
- 346 "Daniel Winkler Knifemaker, LLC", OpenCorporates, https://opencorporates.com/companies/us_nc/1277045; "About", Winkler Knives, <https://winklerknives.com/pages/about>; "Daniel Winkler Knifemaker, LLC", LinkedIn, <https://www.linkedin.com/company/daniel-winkler-knifemaker-llc>.
- 347 "Sportsgear Outdoor Products LLC", OpenCorporates, https://opencorporates.com/companies/us_ks/8329682; "19-267 - Sportsgear Outdoor Products, LLC v. Leonard", US Government Publishing Office, https://www.govinfo.gov/app/details/USCOURTS-mowd-4_19-cv-00267/summary;
- 348 "About Athlon", Athlon Optics, <https://athlonoptics.com/about/>; "Military & LEO", Athlon Optics, <https://athlonoptics.com/military-leo/>.
- 349 "About", Thermo Fisher Scientific.
- 350 "Contact us", Thermo Fisher Scientific.
- 351 "Our Story", Pelican, <https://www.pelican.com/us/en/about/our-story/>; "Professional", Pelican, <https://www.pelican.com/us/en/professional/>.
- 352 "Contact Abbott" [联络雅培], Abbott, <https://archive.ph/RifHh>.
- 353 "Abbott to Acquire Alere, Becoming Leader in Point of Care Testing and Significantly Advancing Global Diagnostics Presence", Abbott, February 1, 2016, <https://abbott.mediaroom.com/2016-02-01-Abbott-to-Acquire-Alere-Becoming-Leader-in-Point-of-Care-Testing-and-Significantly-Advancing-Global-Diagnostics-Presence>.
- 354 "Contacting Abbott", Abbott, <https://www.abbott.com/contact.html>.
- 355 "Our Company", Ryan Technologies; Source documents held by Recorded Future.
- 356 "E.C. Ryan International, Inc.", OpenCorporates.
- 357 "Company Introduction", Beijing Ryan Wende Science and Technology Co., Ltd..
- 358 "Company Introduction", Ryan Huade.
- 359 "About", Resonant.
- 360 Source documents held by Recorded Future.
- 361 "About", Resonant; "Our Company", Ryan Technologies.
- 362 "Exclusive! 2018 China International Exhibition of Police Equipment Exhibitor List Collection" [独家! 2018国际警用装备博览会参展名录合集], Special Equipment Net [特种装备网], May 8, 2018, <https://archive.ph/os3nW>.
- 363 "FLIR Systems Inc", Bloomberg.
- 364 "About Teledyne FLIR", Teledyne FLIR.
- 365 "Teledyne to Acquire FLIR Systems", Teledyne; "Teledyne FLIR Company History, Teledyne FLIR; "About Us", Teledyne Technologies.
- 366 "Alere Inc. (Alere Inc.) Description and Recruitment Information" [美艾利尔公司 (Alere Inc.) 介绍及招聘信息], Zhejiang University School of Medicine [浙江大学医学院], October 9, 2012, <https://archive.ph/thPmP>
- 367 "Abbott to Acquire Alere".
- 368 "Abbott to Acquire Alere".
- 369 "Contacting Abbott"
- 370 "Our Story", Pelican; "Professional", Pelican.
- 371 "Company Introduction" [公司简介], Thermo Fisher Scientific, <https://archive.ph/0JA2B>.
- 372 "About", Thermo Fisher Scientific.
- 373 "Contact us", Thermo Fisher Scientific.
- 374 "Our Company", Ryan Technologies; "Ryan Company Will Participate in '2014 7th China International Exhibition of Police Equipment'", Ryan Huade.
- 375 "E.C. Ryan International, Inc.", OpenCorporates.; Source documents held by Recorded Future.
- 376 "Company Introduction", Beijing Ryan Wende Science and Technology Co., Ltd.
- 377 "Company Introduction", Ryan Huade.
- 378 "About", Resonant.
- 379 Source documents held by Recorded Future.
- 380 "About", Resonant; "Our Company", Ryan Technologies.
- 381 "Enstrom Helicopter Corporation", Enstrom Helicopter Corporation.
- 382 "About Us", Enstrom Helicopter Corporation.

- 383 "Enstrom Helicopter Acquires New Owner"; "10th China International Exhibition on Police Equipment", CIEPE; "Chongqing Helicopter Industry Investment Co., Ltd.", China Aviation Talent Net; "Company Introduction" [公司简介]; "Dealers & Reps - Asia", Enstrom Helicopter Corporation
- 384 "Enstrom Helicopter files for bankruptcy".
- 385 Jawor, "New owner to reopen former Enstrom Helicopter Facility"; "Enstrom Rescued From Bankruptcy By MidTex Aviation".
- 386 "About Us" [关于我们], B&W Tek, <https://archive.ph/oaxyb>.
- 387 "About Us", B&W Tek, <https://bwtek.com/about-us/>.
- 388 "Toyota, Ford report strong sales in China", NBC News, July 5, 2007, <https://www.nbcnews.com/id/wbna19617069>; Restructure of Changan Ford Mazda Automobile Approved", Mazda, November 30, 2012, <https://newsroom.mazda.com/en/publicity/release/2012/201211/121130b.html>.
- 389 "Locations", Ford, <https://corporate.ford.com/operations/locations.html>.
- 390 Exhibitor List" [展商名录], China Suppliers [中国供应商], view-source:<https://archive.ph/DKKFt>; "2014 China Police Expo (CIEPE) Quickly Approaching", Ryan Technologies.
- 391 "Our Company", Ryan Technologies; Source documents held by Recorded Future.
- 392 "E.C. Ryan International, Inc.", OpenCorporates.
- 393 "Company Introduction", Beijing Ryan Wende Science and Technology Co., Ltd..
- 394 "Company Introduction", Ryan Huade.
- 395 "About", Resonant.
- 396 Source documents held by Recorded Future.
- 397 "About", Resonant; "Our Company", Ryan Technologies.
- 398 "5th China International Exhibition of Police Equipment Floor Plan" [第五届中国国际警用装备博览会展位图].
- 399 "5th China International Exhibition of Police Equipment Floor Plan".
- 400 "Contact Us", Jupiter, <https://www.jupiter.com/about/contact-us/>.
- 401 "5th China International Exhibition of Police Equipment Floor Plan".
- 402 "Smiths Group announces completion of acquisition of Morpho Detection", Smiths Detection, April 7, 2017, <https://www.smithsdetection.com/press-releases/smiths-group-announces-completion-acquisition-morpho-detection/>; "Safran announces sale of Morpho Detection LLC.", Safran Group, April 7, 2017, [https://www.safran-group.com/news/safran-announces-sale-morpho-detection-llc-2017-04-07](https://www.safran-group.com/news/safran-announces-sale-morpho-detection-llc-2017-04-07;); "Safran SA - Headquarters", Safran Group, <https://www.safran-group.com/locations/france/safran-headquarter-2077137>.
- 403 "Our Story", Pelican; "Professional", Pelican.
- 404 "Our Company", Ryan Technologies; Source documents held by Recorded Future.
- 405 "E.C. Ryan International, Inc.", OpenCorporates.
- 406 "Company Introduction", Beijing Ryan Wende Science and Technology Co., Ltd..
- 407 "Company Introduction", Ryan Huade.
- 408 "About", Resonant.
- 409 Source documents held by Recorded Future.
- 410 "About", Resonant; "Our Company", Ryan Technologies.
- 411 "Company Introduction", [公司简介], Glocom Shanghai, <https://web.archive.org/web/20170313095927/http://www.glocom-sh.com/about.asp>; "Office Locations", Glocom US, http://www.glocom-communications.com/index.php?_m=mod_article&_a=article_content&article_id=101; "5th China International Exhibition of Police Equipment Floor Plan".
- 412 "Company Profile", Glocom US, http://www.glocom-communications.com/index.php?_m=mod_article&_a=article_content&article_id=97.
- 413 "China Police 2006 Directory of Local Exhibitors", cpexhibition.com, <http://www.cpexhibition.com/police/2006/Manual/chinlist.doc>.
- 414 "Locations", Armor USA Inc., <https://www.armorusa.com/contact-us-2/>.
- 415 "China Police 2006 Directory of Local Exhibitors".
- 416 "About Weibridge", Weibridge, <https://web.archive.org/web/20110428154427/http://weibridge.com/company/>.
- 417 "About Weibridge", Weibridge.
- 418 "About Weibridge", Weibridge; "Contact Us", Weibridge, <https://web.archive.org/web/20110428152655/http://weibridge.com/contact-us/>.
- 419 "5th China International Exhibition of Police Equipment Floor Plan".
- 420 "L-3 Communications completes acquisition of PerkinElmer detection-systems business", Vision Systems Design, June 18, 2002, <https://www.vision-systems.com/non-factory/environment-agriculture/article/16741392/l3-communications-completes-acquisition-of-perkinelmer-detectionsystems-business>; "Our History", L3Harris, <https://www.l3harris.com/company/our-history>; "Leidos completes acquisition of L3Harris Technologies' Security Detection and Automation Businesses creating a comprehensive, global security and detection portfolio", Leidos, May 4, 2020, <https://www.leidos.com/insights/leidos-completes-acquisition-l3harris-technologies-security-detection-and-automation>.
- 421 "About US", L3Harris.
- 422 "Leidos Announces Move to New Headquarters Facility in Reston Town Center", Leidos, January 30, 2018, <https://investors.leidos.com/news-and-events/news-releases/press-release-details/2018/Leidos-Announces-Move-to-New-Headquarters-Facility-in-Reston-Town-Center/default.aspx>.
- 423 "3M China" [3M中国], 3M, <https://archive.ph/h3sLJ>.
- 424 "Our brands", 3M, https://www.3m.com/3M/en_US/company-us/our-brands/; "3M Government", 3M, https://www.3m.com/3M/en_US/government-us/.
- 425 "3M Help Center", 3M.
- 426 "Motorola", China Net [中国网], December 25, 2012, <https://archive.ph/lS9tP>.
- 427 "Motorola to Officially Split into Two Firms Tuesday".
- 428 A "Motorola Solutions (China) Ltd. Employee Personal Information Form" uploaded to Motorola Solutions' website also bears the title of "Motorola (China) Electronics Ltd. Employee Personal Information Form" (摩托罗拉(中国)电子有限公司员工资料表). See "MSCL Employee Personal Information Form", Motorola Solutions, view-source:<https://archive.ph/OkStf>.
- 429 "Motorola Solutions", LinkedIn.
- 430 "Office Locations", Motorola Solutions.
- 431 "Who We Are", Autoclear, <https://autoclear.com/about.php>.
- 432 "Who We Are", Autoclear.
- 433 "5th China International Exhibition of Police Equipment Floor Plan"; "Excel Engineering Inc.", Panjiva, <https://panjiva.com/Excel-Engineering-Inc/2320169>.

- 434 "Honeywell Names Scott Zhang President of Honeywell China", Honeywell, October 31, 2019, <https://www.honeywell.com/us/en/press/2019/11/honeywell-names-scott-zhang-president-of-honeywell-china>; "About Us" [关于我们], Honeywell UOP, <https://archive.ph/oX1uy>.
- 435 5th China International Exhibition of Police Equipment Floor Plan".
- 436 "Our New Headquarters: By The Numbers", Honeywell, <https://www.honeywell.com/us/en/news/2021/11/honeywells-new-headquarters-by-the-numbers>.
- 437 "Toyota, Ford report strong sales in China".
- 438 "Restructure of Changan Ford Mazda Automobile Approved".
- 439 "Locations", Ford.
- 440 "China International Exhibition on Police Technologies & Equipment 2008 List of Exhibitors", cpehhibition.com, <https://archive.ph/rREtq>; "Asia Pacific China Police 2010", cpehhibition.com, <https://archive.ph/vmhBA>.
- 441 "3M China" [3M中国], 3M.
- 442 "Our brands", 3M; "3M Government", 3M.
- 443 "3M Help Center", 3M.
- 444 "Motorola", China Net.
- 445 "Motorola to Officially Split into Two Firms Tuesday".
- 446 A "Motorola Solutions (China) Ltd. Employee Personal Information Form" uploaded to Motorola Solutions' website also bears the title of "Motorola (China) Electronics Ltd. Employee Personal Information Form" (摩托罗拉(中国)电子有限公司员工工资料表). See "MSCL Employee Personal Information Form", Motorola Solutions.
- 447 "Motorola Solutions", LinkedIn.
- 448 "Office Locations", Motorola Solutions.
- 449 "About SAIC-GM" [关于上汽通用汽车], SAIC-GM, <https://archive.ph/mKVre>.
- 450 "General Motors China", General Motors, 2014, <https://archive.ph/2Wmd3>.
- 451 "General Motors China", General Motors.
- 452 "GM in the U.S.", General Motors, <https://www.gm.com/company/usa-operations>.
- 453 "Our Company", Ryan Technologies; Source documents held by Recorded Future.
- 454 "E.C. Ryan International, Inc.", OpenCorporates.
- 455 "Company Introduction", Beijing Ryan Wende Science and Technology Co., Ltd..
- 456 "Company Introduction", Ryan Huade.
- 457 "About", Resonant.
- 458 Source documents held by Recorded Future.
- 459 "About", Resonant; "Our Company", Ryan Technologies.
- 460 "Subsidiaries", DuPont, June 11, 2021, <https://www.dupont.com/subsidiaries.html>.
- 461 "About Us", DuPont, <https://www.dupont.com/about.html>.
- 462 "Global Locations", DuPont, <https://www.dupont.com/locations.html>.
- 463 "FLIR Systems Inc", Bloomberg.
- 464 "About Teledyne FLIR", Teledyne FLIR.
- 465 "Teledyne to Acquire FLIR Systems", Teledyne; "Teledyne FLIR Company History", Teledyne FLIR; "About Us", Teledyne Technologies.
- 466 "Panoscan Inc.", Responder Corp, February 2, 2018, <https://www.respondercorp.com/2018/02/02/panoscan-inc/>; "Panoscan", Panoscan Inc., <https://web.archive.org/web/20220320101103/https://www.panoscan.com/>.
- 467 "Our Story", Pelican; "Professional", Pelican.
- 468 "Why Streamlight?", Streamlight, <https://www.streamlight.com/resources/learning-left/why-streamlight>.
- 469 "Contact Us", Streamlight, <https://www.streamlight.com/contact-us>.
- 470 Source documents held by Recorded Future.
- 471 "Groen Brothers Aviation Team Successfully Achieves Third Milestone of Its DARPA Contract to Design Next Generation High Speed Rotorcraft", Skyworks Aeronautics, August 17, 2006, <https://www.skyworks-aero.com/groen-brothers-aviation-team-successfully-achieves-third-milestone-of-its-darpa-contract-to-design-next-generation-high-speed-rotorcraft/>.
- 472 "Groen Brothers Aviation Team Successfully Achieves Third Milestone of Its DARPA Contract to Design Next Generation High Speed Rotorcraft".
- 473 "About GAC", Groen Aeronautics Corporation, <https://web.archive.org/web/20170226122808/https://www.groenaeronautics.com/about-gba/>.
- 474 "Groen Aeronautics Re-Branded As Skyworks Global", PR Newswire, April 24, 2017, <https://www.prnewswire.com/news-releases/groen-aeronautics-re-branded-as-skyworks-global-300443898.html>.
- 475 "Skyworks Locations", Skyworks, <https://www.skyworksinc.com/Articles/Locations>.
- 476 "OpenText Buys Guidance Software", OpenText, September 14, 2017, <https://www.opentext.com/about/press-releases?id=58E6100FE1544BE18AB91512C1060E90>; "OpenText EnCase Forensic", OpenText, <https://security.opentext.com/encase-forensic>.
- 477 "OpenText Buys Guidance Software".
- 478 "Contact", Guidance Software, <https://web.archive.org/web/20160315092109/https://www.guidancesoftware.com/support#contact>; "Global office locations, OpenText, <https://www.opentext.com/about/office-locations>.
- 479 "Honeywell Automation India Ltd. Annual Report 2013", Honeywell, <https://www.honeywell.com/content/dam/honeywellbt/en/documents/downloads/india-hail/financials/annual-reports/annual-report-2013.pdf>.
- 480 5th China International Exhibition of Police Equipment Floor Plan".
- 481 "Our New Headquarters: By The Numbers", Honeywell, <https://www.honeywell.com/us/en/news/2021/11/honeywells-new-headquarters-by-the-numbers>.
- 482 "3M China" [3M中国], 3M.
- 483 "Our brands", 3M; "3M Government", 3M.
- 484 "3M Help Center", 3M.
- 485 "Subsidiaries and Affiliates of W. L. Gore & Associates", Gore, <https://www.gore.com/affiliates>.
- 486 "About Gore", Gore, <https://www.gore.com/about/the-gore-story#overview>.
- 487 "Contact", Gore, <https://www.gore.com/contact>.
- 488 "About SAIC-GM", SAIC-GM.

489 "General Motors China", General Motors.

490 "General Motors China", General Motors.

491 "GM in the U.S.", General Motors.

492 "Applied Biosystems", Thermo Fisher Scientific, <https://www.thermofisher.com/se/en/home/brands/applied-biosystems.html>.

493 "Invitrogen and Applied Biosystems Complete Merger"; Krauskopf and Clarke, "Invitrogen to buy Applied Biosystems for \$6.7 bln".

494 "Thermo Fisher Scientific Completes Acquisition of Life Technologies Corporation".

495 "Contact us", Thermo Fisher Scientific, <https://corporate.thermofisher.com/us/en/index/contact-us.html>.

496 "Our Company", Ryan Technologies; Source documents held by Recorded Future.

497 "E.C. Ryan International, Inc.", OpenCorporates.

498 "Company Introduction", Beijing Ryan Wende Science and Technology Co., Ltd..

499 "Company Introduction", Ryan Huade.

500 "About", Resonant.

501 Source documents held by Recorded Future.

502 "About", Resonant; "Our Company", Ryan Technologies.

503 "Image and Text: China International Exhibition of Police Equipment Floor Plan (9)" [图文：中国国际警用装备博览会展位图(9)], Sina [新浪], June 25, 2004, <https://archive.ph/pM3Fq>.

504 "General Motors Co", Bloomberg, <https://www.bloomberg.com/profile/company/GM:US>; "GM in the U.S.", General Motors.

505 5th China International Exhibition of Police Equipment Floor Plan".

506 "Our New Headquarters: By The Numbers", Honeywell, <https://www.honeywell.com/us/en/news/2021/11/honeywells-new-headquarters-by-the-numbers>.

507 5th China International Exhibition of Police Equipment Floor Plan".

508 "Contact Us", Garrett Electronics, Inc., <https://garrett.com/contact>.

509 "Contact Us", Astrophysics Inc., <https://www.astrophysicsinc.com/contact/>.

510 "Contact US", Bullard, <https://www.bullard.com/contact-us/>.

511 "Company Introduction" [公司介绍], Morning Sun [美阳 (天津) 国际有限公司], <https://archive.ph/zPoJ2>.

512 "General Electric Company to Acquire Everest VIT, Inc.", GE Aviation, July 18, 2005, <https://www.geaviation.com/press-release/other-news-information/general-electric-company-acquire-everest-vit-inc>.

513 "Company Introduction" [公司介绍], Beijing WAEVT Industrial Endoscope Co., Ltd. [北京韦林意威特工业内窥镜有限公司], <https://archive.ph/pFKem>.

514 "A new brand for Inspection Technologies: The Waygate Technologies Story", Baker Hughes Digital Solutions, <https://www.bakerhughesds.com/news-story/new-brand-inspection-technologies-waygate-technologies-story>.

515 "Company History", Maglite, <https://maglite.com/blogs/maghistory-blog-1/company-history>.

516 "About Us", DKL International, Inc., <http://www.dklabs.com/about.php>.

517 "About", Zistos, <https://zistos.com/about/>.

518 "Contact Us", CMC, <https://www.cmcpro.com/contact-us/>.

519 "About Us", Morphix Technologies, <https://morphitec.com/about/>.

520 "About Us", Ancom, <https://archive.ph/5ztUp>.

521 "About Us", Blackhawk, <https://www.blackhawk.com/about-us.html>.

522 "Corporate Locations", 5.11 Tactical, <https://www.511tactical.com/company-info/corporate>.

523 "Brand Story", Luminox, <https://luminox.com/pages/brand-story>.

524 "Introduction", Alpha Industries, <https://www.alphaindustries.com/pages/heritage>.

525 "Company Introduction" [公司简介], Shenzhen Crazy Horse Economic Trade Co., Ltd [深圳市悍马经贸有限公司], <https://archive.ph/pxWQs>.

526 "Why ESS", ESS, https://www.esseyepro.com/en_us/why-ess.

527 "Leatherman Story", Leatherman, <https://www.leatherman.com/int/leatherman-story.html>.

528 "History", Rocky, <https://www.rockyboots.com/history/>.

529 "Product Center" [产品中心], Beijing Yin He Xing Yue Technology Co., Ltd. [北京银河星月科技有限公司], <https://archive.ph/0MGDd>.

530 "Who We Are", Federal Signal, <https://www.federalsignal.com/who-we-are>.

531 "About", Code 3 ESG, <https://www.code3esg.com/us/en/About/>.

532 "About Us", SoundOff Signal, <https://soundoffsignal.com/about-us/>.

533 "About", Will-Burt, <https://www.willburt.com/about/>.

534 "About Us", Intoximeters, <https://www.intox.com/about-us/>.

535 Source documents held by Recorded Future.

536 "Company Introduction" [公司简介], Beijing Zhongtaitong Science and Technology Development Co., Ltd. [北京中泰通科技发展有限公司], <https://archive.ph/Ndoou>.

537 "Locations", Coherent, <https://www.coherent.com/company/locations/>; "Contact Us", CRAIC, <https://www.microspectra.com/contact-us/contact-us>.

538 "Caliper Life Sciences Pays \$20M for Cambridge Research & Instrumentation", Genetic Engineering & Biotechnology News, December 9, 2010, <https://www.genengnews.com/news/caliper-life-sciences-pays-20m-for-cambridge-research-instrumentation/>.

539 "PerkinElmer Completes Acquisition of Caliper Life Sciences", PerkinElmer, November 7, 2011, <https://ir.perkinelmer.com/news-releases/news-release-details/perkinelmer-completes-acquisition-caliper-life-sciences>.

540 "Varispec Liquid-Crystal Adjustable Harmonic Filter Light Device" [Varispec 液晶可调谐滤光器], NBL Imaging System Ltd., <https://archive.ph/YYAfI>.

541 "Contact Us", Firetide, <https://www.firetide.com/about/contact-us/>.

542 "Contact", SPEX Forensics, <https://forensics.com/contact>.

543 "About Us", Teledyne Princeton Instruments, <https://www.princetoninstruments.com/about-us>.

544 "About Longhao" [关于龙昊], Beijing LongHope Police Equipment Co., Ltd. [京龙昊安华警用器材科技有限公司], <https://web.archive.org/web/20120324081955/http://www.lhpolitech.com/gylh.htm>; "Products and Services" [产品服务], Beijing LongHope Police Equipment Co., Ltd. [京龙昊安华警用器材科技有限公司], <https://web.archive.org/web/20171105065115/http://www.lhpolitech.com/cpfw.htm>.

545 "About ATN", ATN Corp, <https://www.atncorp.com/aboutcompany/>; "Burriss Optics", Burriss Optics, <https://www.burrisoptics.com/>.

546 "Textron Aviation", Textron, <https://www.textron.com/About/Our-Businesses/Textron-Aviation>; "Contact Us", Textron, <https://www.textron.com/Contact-Us>.

- 547 "Robinson Helicopter Company Contact Information", Robinson Helicopter Company, <https://robinsonheli.com/contact-robinson-helicopter-company/>.
- 548 "Air Tractor", Air Tractor, <https://airtractor.com/>.
- 549 "Products Introduction" [产品介绍], PTE Systems Ltd., <https://archive.ph/pUuC5>.
- 550 "Company", Cognitech.
- 551 Latent Master 2005: Digital Latent Fingerprint Workstation.
- 552 "Beijing", Ryan Technologies, <https://archive.ph/4p2vh>.
- 553 "Shanghai", Ryan Technologies, <https://archive.ph/cLkAP>.
- 554 "Wuhan", Ryan Technologies, <https://archive.ph/A3gU8>.
- 555 "Chendu", Ryan Technologies, <https://archive.ph/CPRSa>.
- 556 "Guangzhou", Ryan Technologies, <https://archive.ph/FmoLx>.
- 557 "Shenyang", Ryan Technologies, <https://archive.ph/gS0iw>.
- 558 Source documents held by Recorded Future.
- 559 Source documents held by Recorded Future.