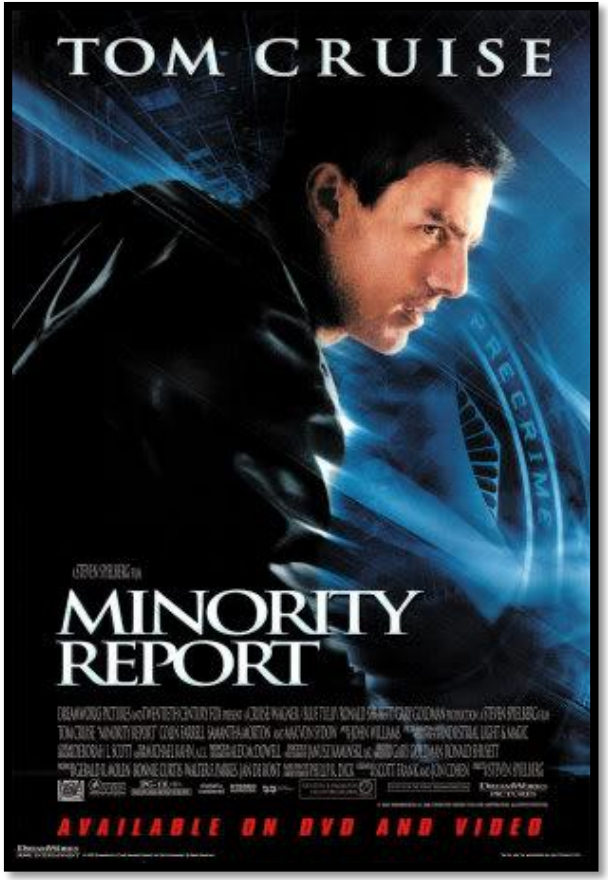
Enterprise Immune System 企業免疫系統

以機械學習智慧應用技術，抵禦各類型先進資安威脅

產品經理 廖本凱 Eason Liao

資安事件是否可以預防?



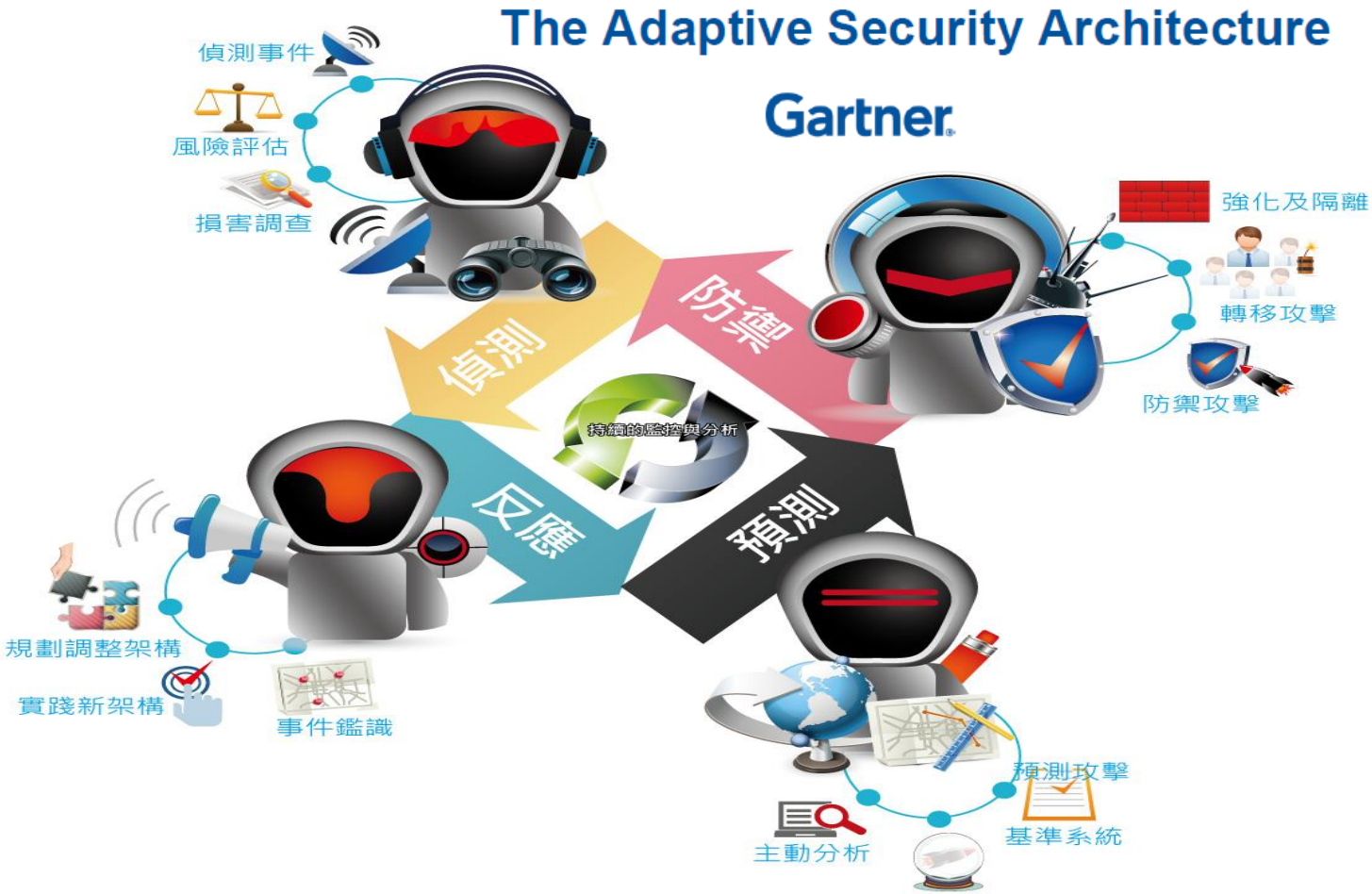
《關鍵報告-2002 湯姆克魯斯》

知己知彼，掌握到駭客的攻擊手法

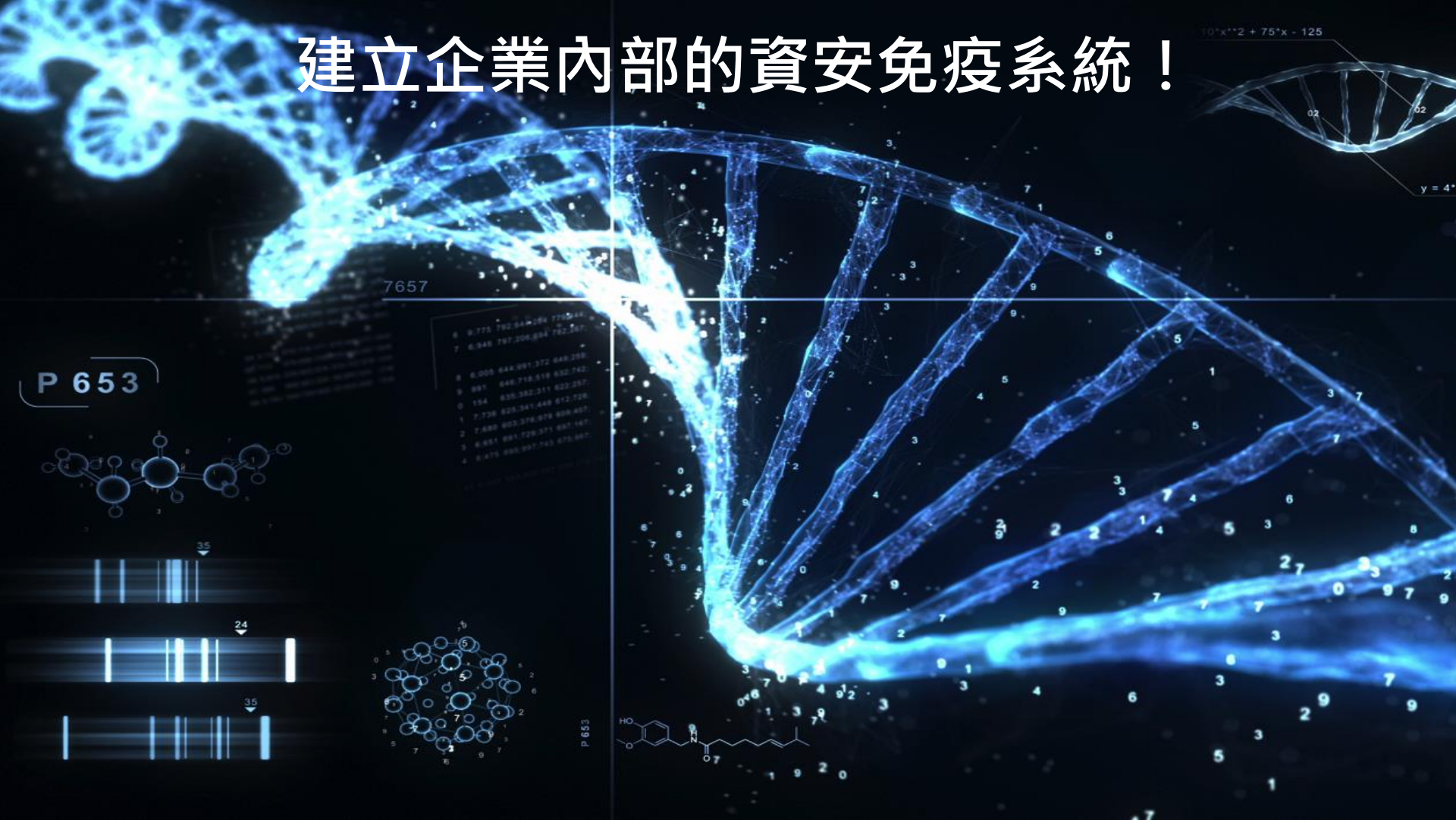
《孫子兵法·謀攻篇》

- 能不能在資安事件發生之前，就能先預先洞察出威脅的來源？
- 事件發生

除了被動阻擋，更應該轉為主動預知



建立企業內部的資安免疫系統！



何謂知己？何謂知彼？

最終一役 AlphaGo 再奪勝！人機世紀大戰最終比數 4：1 電腦勝

作者 呂 紹玉 | 發布日期 2016 年 03 月 15 日 17:01 | 分類 Google , 人工智慧 , 尖端科技

關於 DARKTRACE

DARKTRACE

不需特徵碼

機器學習技術

即時偵測異常

- 2013 年成立於英國劍橋
- 由數學家與政府情報專家組成
- 以機械學習與數學定理為核心
- 總部設於英國劍橋與美國舊金山
- 全球已服務超過 200家重要客戶
- 已於全球17個國家建立營運據點

- 榮獲 2015 Info Security Global Excellence Awards 【年度最佳資訊安全服務企業】獎項
- 榮獲 2015 Network Products Guide IT World 【最佳內部威脅偵測解決方案】獎項
- 榮獲 2015 Gartner 【年度最酷資安廠商】風雲獎項
- 榮獲世界經濟論壇【2015 技術先行者】獎項

Gartner 2015 CoolVendor

2015 Computing Security Awards WINNER

Info Security Products Guide 2015 GLOBAL EXCELLENCE GOLD

WORLD ECONOMIC FORUM Technology Pioneer 2015

2015 GOLD STEVIE WINNER AMERICAN BUSINESS AWARDS

NETWORK PRODUCTS GUIDE IT World Awards 2015 GOLD

techworld AWARDS 2014 WINNER

2015 LAURÉAT IT innovation

IET AWARDS The Institution of Engineering and Technology

READER'S CHOICE PRODUCT EXCELLENCE AWARDS 2015

SC MAGAZINE 2015 Europe AWARDS FINALIST

CYBERSECURITY 500 WORLD'S HOTTEST SECURITY COMPANIES

FINALIST Cambridge Business Excellence Awards 2015 Sponsored by BARCLAYS Hewitsons Award for Business Innovation

DARKTRACE EIS企業行為免疫系統

機械學習結合數學演算，翻轉資安傳統防禦技術，洞悉企業網路威脅情狀

DARKTRACE

找出資安設備所找不到的

“潛在異常網路行為”

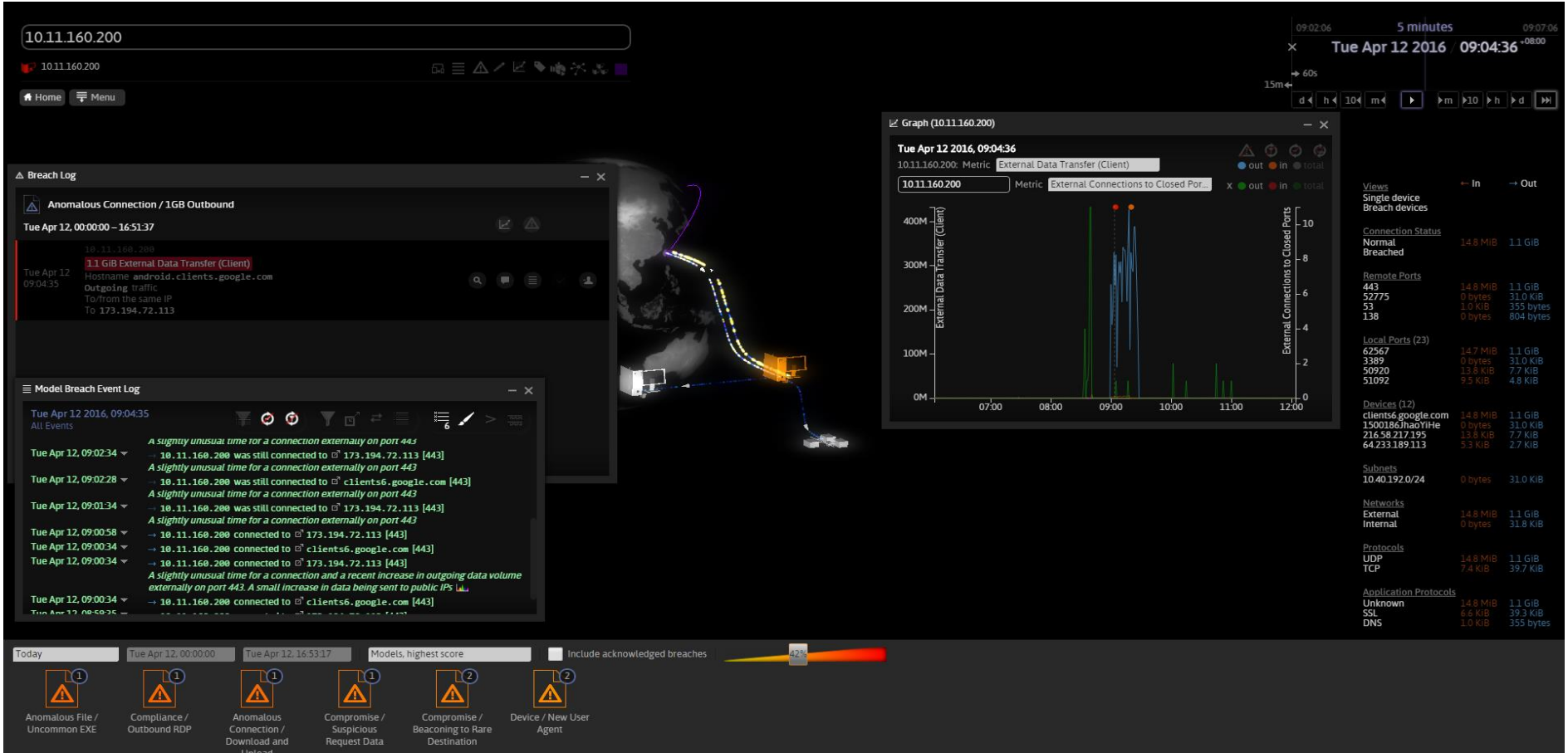
✓偵測網路環境內最細微變化，實時更新企業網路生命特徵數據模型

✓多樣化數據分析比對過往與新興的各式網路數據行為

+ 全自動建構企業資訊網路行為數學模型
+ 百分百完整呈現企業資訊網路傳輸行為
+ 深入個人、主機以及網路設備連線分析
+ 長期分析企業生命特徵，具備異常行為回放機制
+ 自動威脅行為分類，支援工作流程以及協作機制

Darktrace EIS 全3D可視化中控台

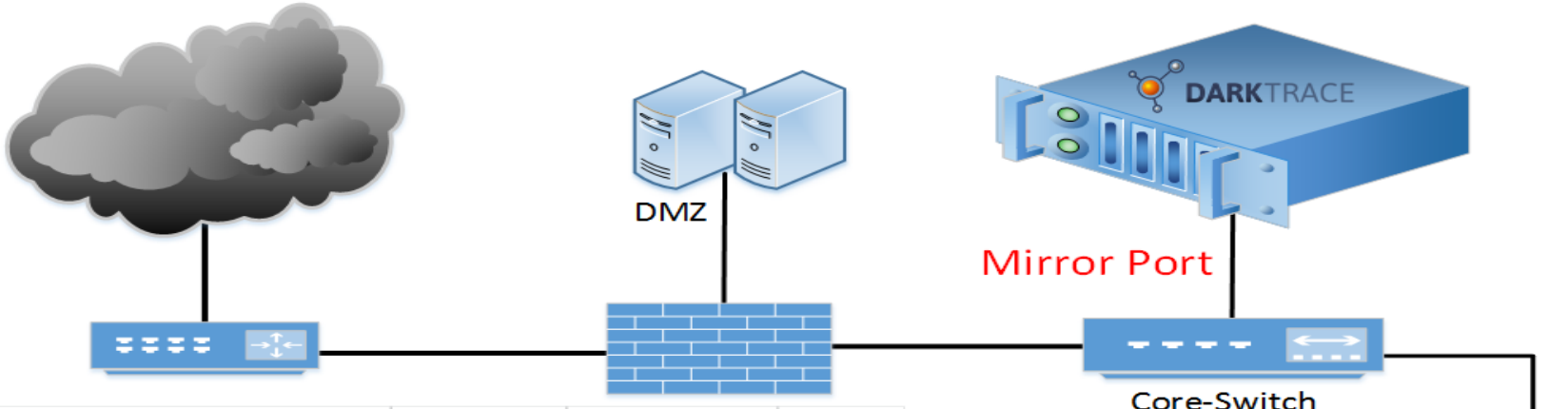
收集並分析網路封包內164種META DATA屬性並建立出DNA



DARKTRACE 可以幫助您找到腦人的勒索軟體

快速找出企業內同樣受駭的IT裝置設備

導入架構單純，不影響現有環境



Component	Port	Direction	Required?
Threat Visualizer and web configuration	443 (TCP)	Inbound	Required
Console application and file transfer via SFTP	22 (TCP)	Inbound	Required
Network Time Protocol	123 (UDP)	Outbound	Required
Syslog ingestion of mapping data	514 (UDP)	Inbound	Optional
DNS querying	53 (TCP & UDP)	Outbound	Optional

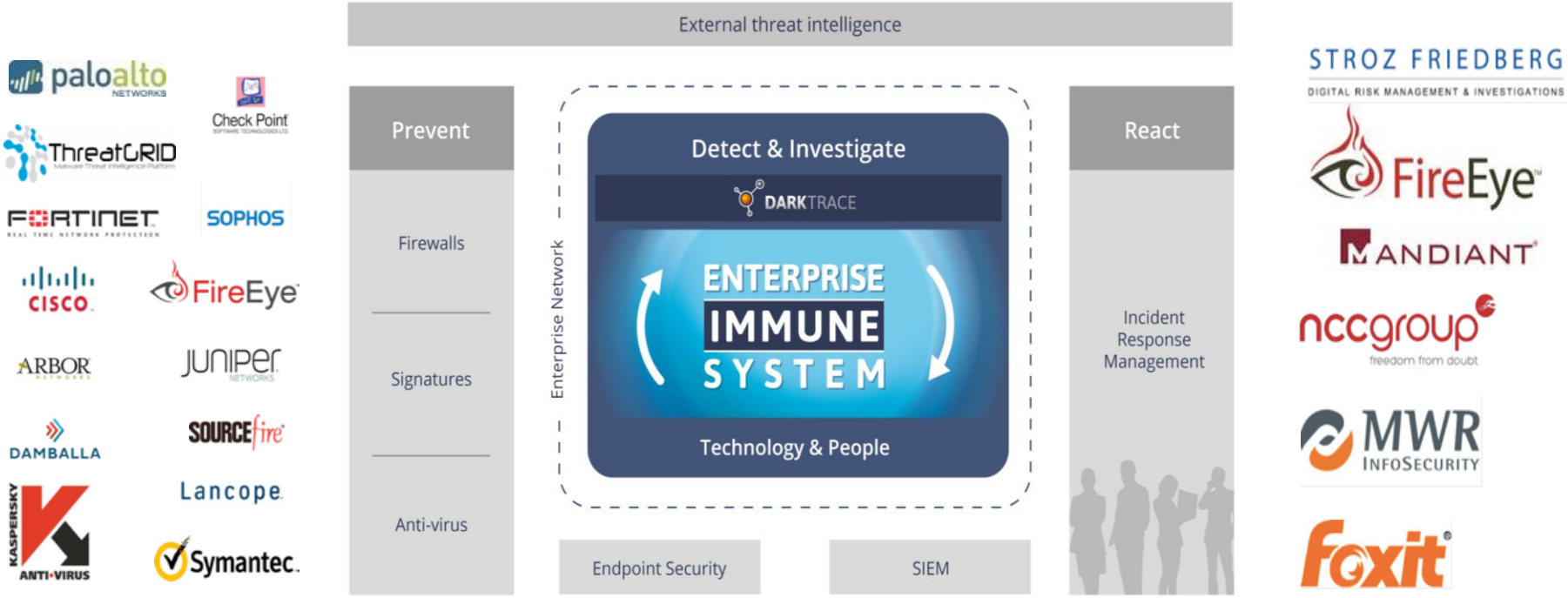
Component	Port	Direction	Required?
Remote management KVM	80, 443, 7578 (TCP)	Inbound	Optional

Component	Port	Direction	Required?
Call-Home	22 (TCP)	Outbound (to specific IP)	Optional

透過模型比對找查異常行為風險

	異常行為	說明描述
1.	Remote access attack linked to dangerous malware RAT攻擊潛伏行為	偵測企業內部殭屍網路行為，發掘隱匿於企業環境內高複雜度、高隱匿性與多樣性的殭屍網路通訊
2.	Anomalous data transfer 異常數據傳輸行為	偵測企業可疑數據傳輸行為，尤其是包裝於一般應用程式外表下，卻對外產生異常連結與通訊
3.	Illegitimate access to database server 非法存取資料庫行為	偵測企業非法存取資料庫行為，尤其是額外的、異常的非加密連線，並分析存取來源與目的間相對關係，並研判其風險程度
4.	Unauthorized use of administrator credentials 未經授權卻使用管理員憑證行為	偵測是否有特權用戶，於特殊期間，發生非工作時間多次登入企業網路環境進行存取行為
5.	Fast travel indicating password compromise 單一帳號多點同時登入行為	偵測單一使用者帳號，卻於不同來源，且同一時間登入企業網路進行存取行為
6.	Connections to website linked to Advanced Persistent Threats 瀏覽網路時遭受APT攻擊行為	偵測使用者瀏覽知名社交網站時，經惡意導向至可疑的站台，可能遭遇APT針對性攻擊的行為
7.	Infection with ransomware 遭勒索軟體感染的行為	偵測使用者瀏覽網路後，遭勒索軟體植入後對主機異常使用與連線行為
8.	Domain Generation Algorithm 使用動態網域演算法的惡意行為	偵測企業主機對外連線，其連結對象為使用動態網域演算法，而產生之大量無效網域名稱行為
9.	Malicious web drive-by 惡意偷渡式攻擊行為	偵測使用者遭受的惡意偷渡式攻擊行為，於使用者電腦已遭受惡意程式感染時，它將竄改電腦設定，將您的正常連線導向一個惡意偽冒網站

透過機器學習讓您的安全防護再次提升



硬體規格符合各客戶的需求

Darktrace appliance	Average sustained throughput	Devices analyzed	Form factor	Data feed interfaces
DCIP-X-11G	5Gbps	36,000	2U rackmount	2 x 10G SFP+ 3 x 1GbE RJ45
DCIP-X-10G	5Gbps	36,000	2U rackmount	2 x 10G SFP+
DCIP-X-1G	3Gbps	25,000	2U rackmount	3 x 1GbE RJ45
DCIP-M-11G	2Gbps	8,000	1U rackmount	2 x 10G SFP+ 3 x 1GbE RJ45
DCIP-S-1G	300Mbps	1,000	1U rackmount	3 x 1GbE RJ45
DCIP-SM-1G	100Mbps	300	Fanless non rackmount	1 x 1GbE RJ45

服務項目：

- 每月產出一份異常威脅評估報告
- 原廠現場客戶端教育訓練2天(英文課程)
- 設備提供RMA

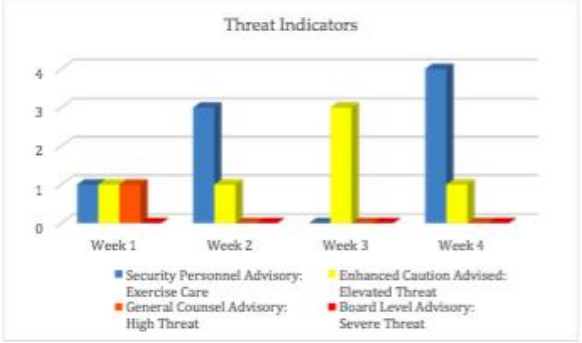
DARKTRACE價值驗證（Proof of Value, POV）計畫

Proof Of Value (POV)

- 檢視企業資訊環境具體情狀
- 標註企業環境高度異常行為
- 專家解析企業網路現有威脅
- 實施資訊環境風險狀態評估
- 提出量身訂製風險改善建議

Threat Intelligence Report (TIR), 企業威脅報告

- 由全球頂尖安全威脅分析師提供網路威脅分析。
- 由全球頂尖安全威脅分析師提供設備諮詢服務。
- 取得基於客戶環境，量身訂製的威脅情報報告。
- 取得對於異常行為，專業並可行的安全性建議。



Week 1

1. Sophisticated malware infection; the device is probably under the attacker's control
2. A user downloaded a suspicious program while attempting to download Google Chrome
3. One device performs trace routes every other day

Week 2

1. Suspicious user behaviours: a user downloads copyrighted TV programmes and transfers files to a home file server
2. A credential is being used on two devices simultaneously
3. Data transferred to Dropbox
4. Use of Telnet between two devices on a Saturday

Week 3

1. One device is regularly Bitcoin mining, possibly due to a malware infection
2. Device downloaded malware while running an out-of-date browser
3. The user reported last week continues to download and then transfer TV programmes to a home file server, now using a different computer

Week 4

1. Large amount of data transferred to Google Drive
2. One device is using the TOR network
3. A device port scanned and attempted access to shared files on another device
4. One device downloaded a third-party VPN client
5. Use of LogMeIn and Disconnect.me services from 8 devices in total

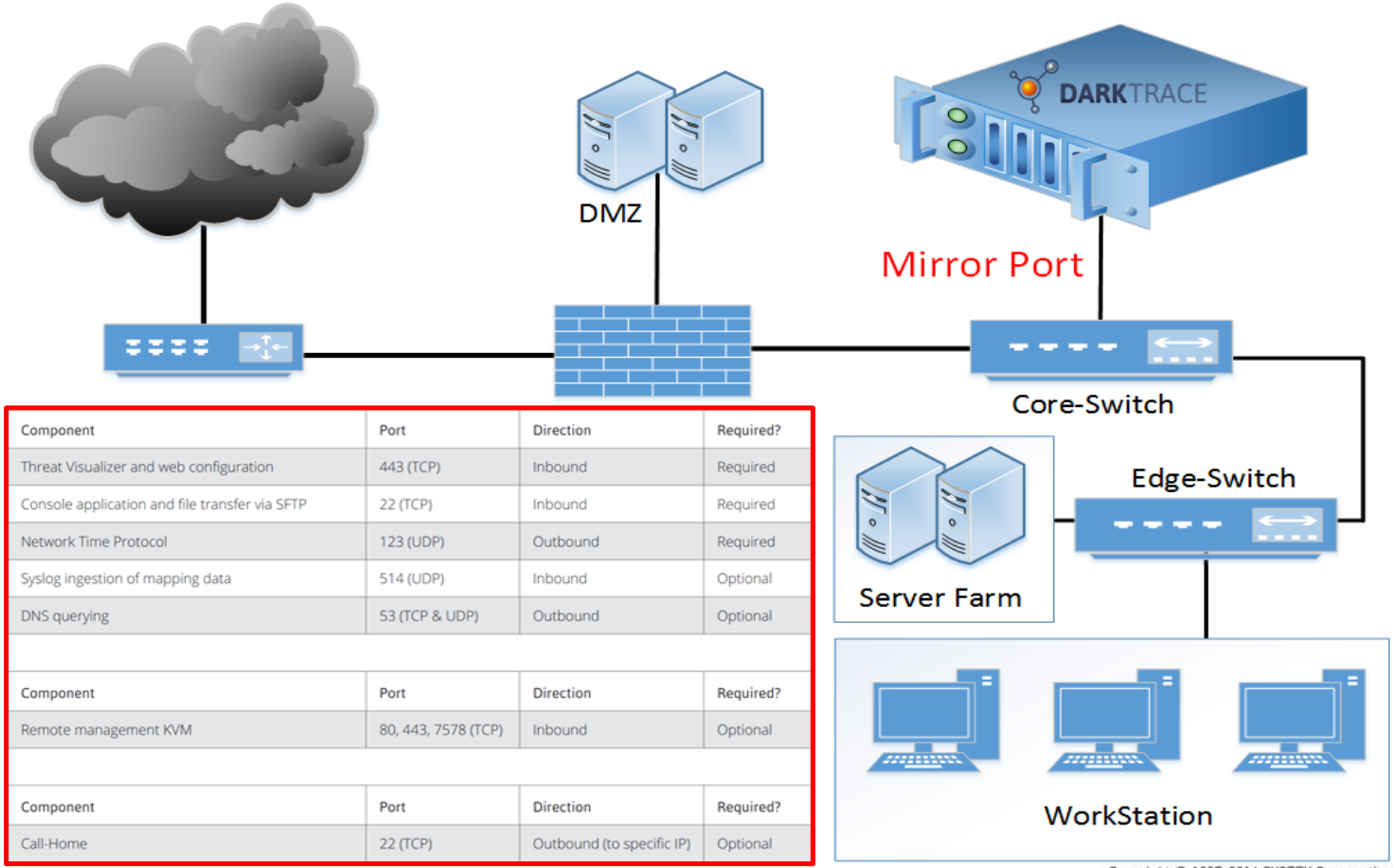
客戶實績

TOYOTA

Johnson Matthey

客戶群涵括能源、電信、金融服務、交通運輸、零售服務業等各領域

導入架構單純，不影響現有環境



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Component	Port	Direction	Required?
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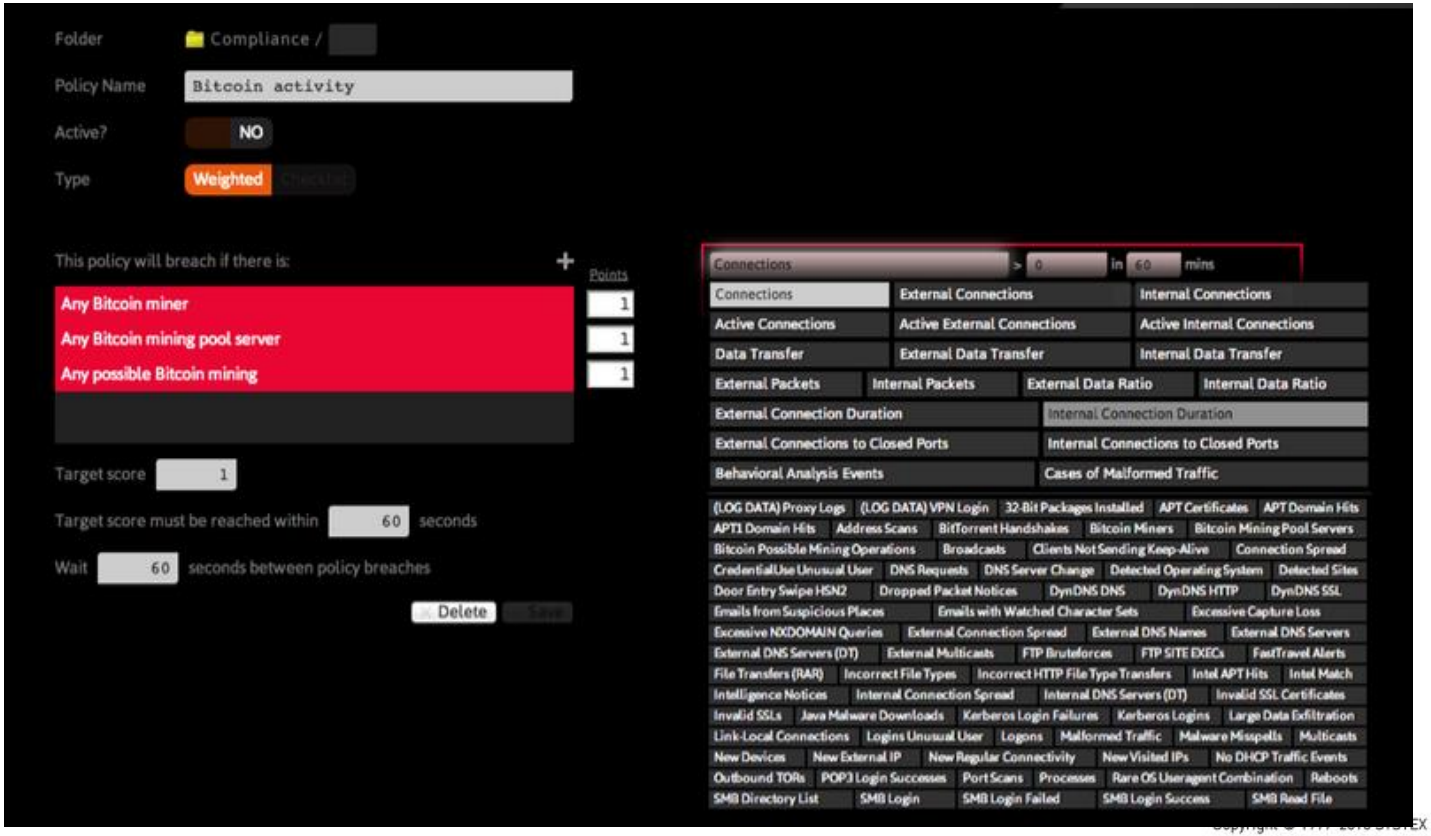
SYSTEX

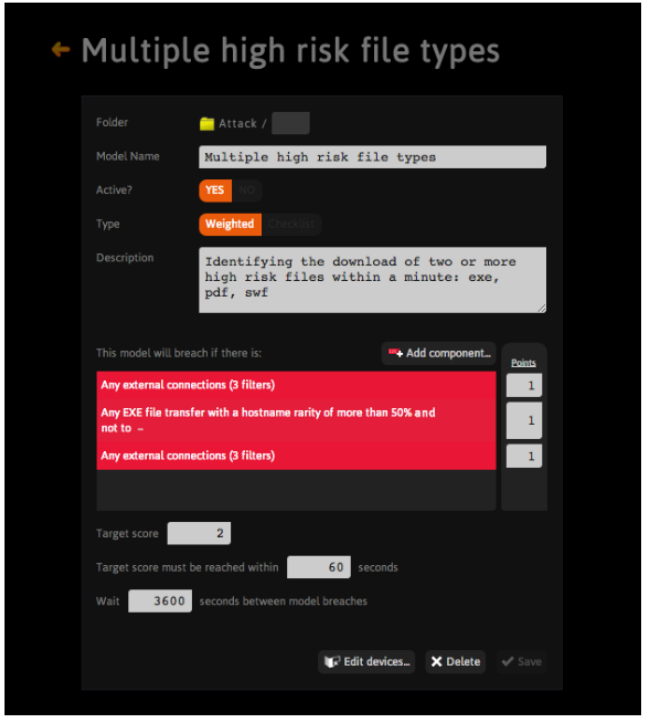
Cloud, Mobile, Social, Analytics & Cybersecurity

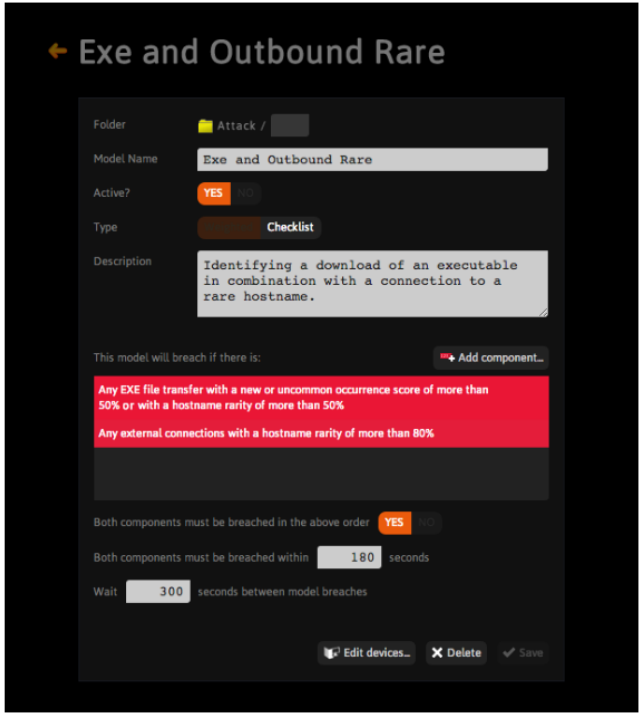
End to End Ecosystem Enabler

安全政策調適

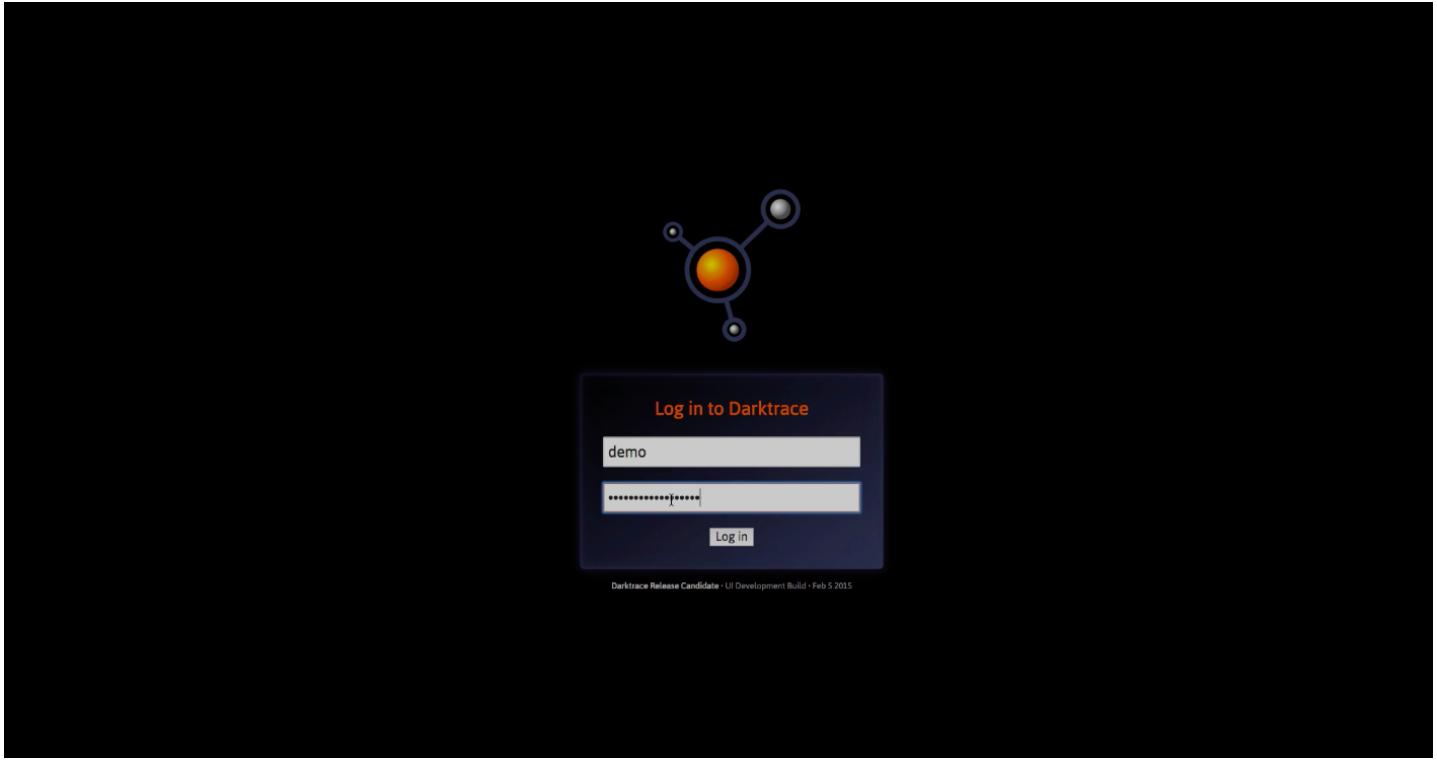


數據模型檢視



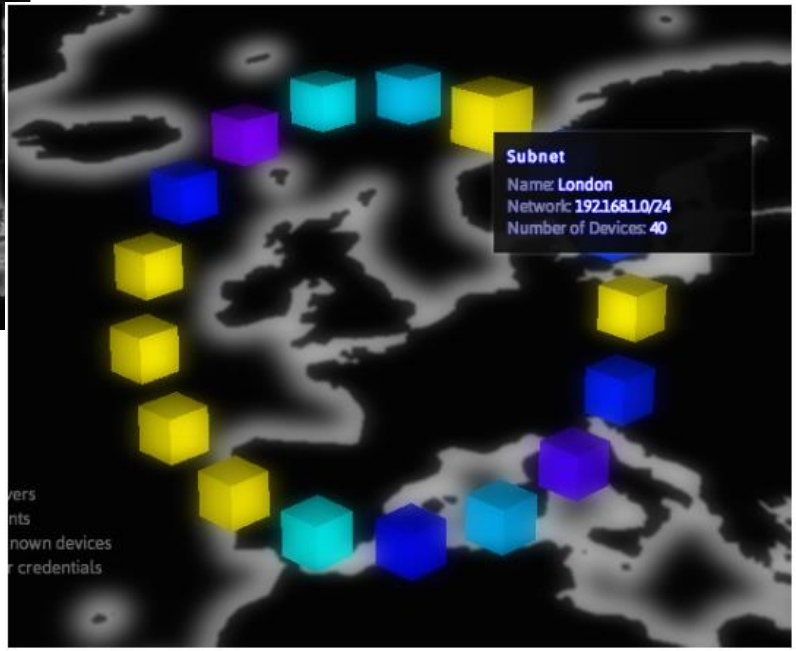


威脅視度展示 1/5

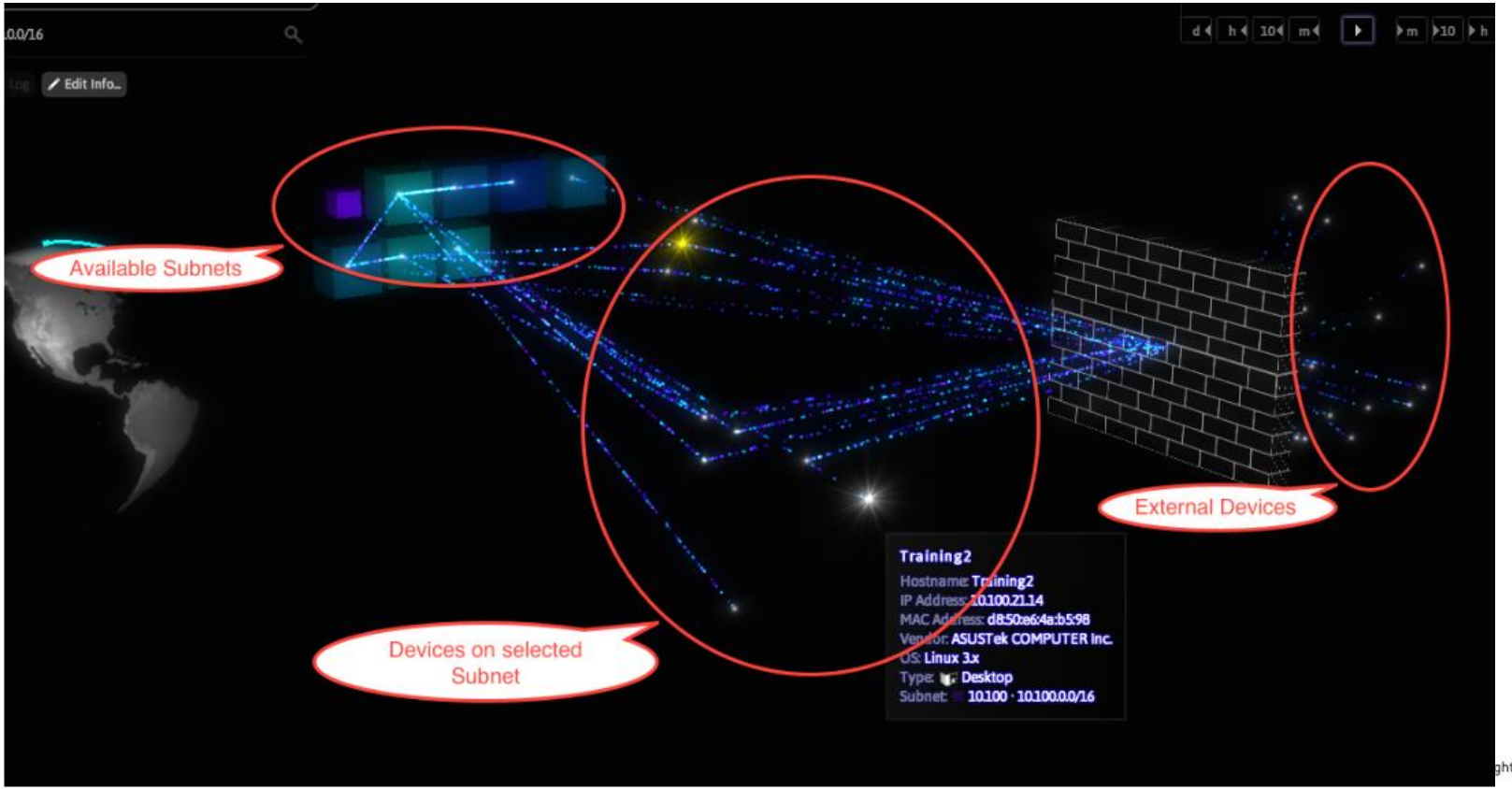


威脅視度展示 2/5

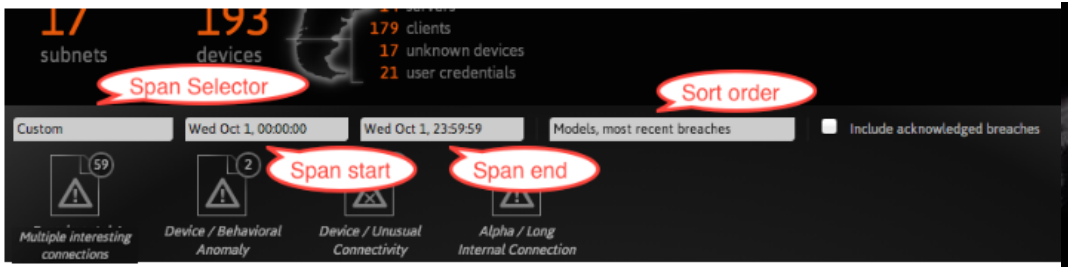
威脅視度展示 3/5

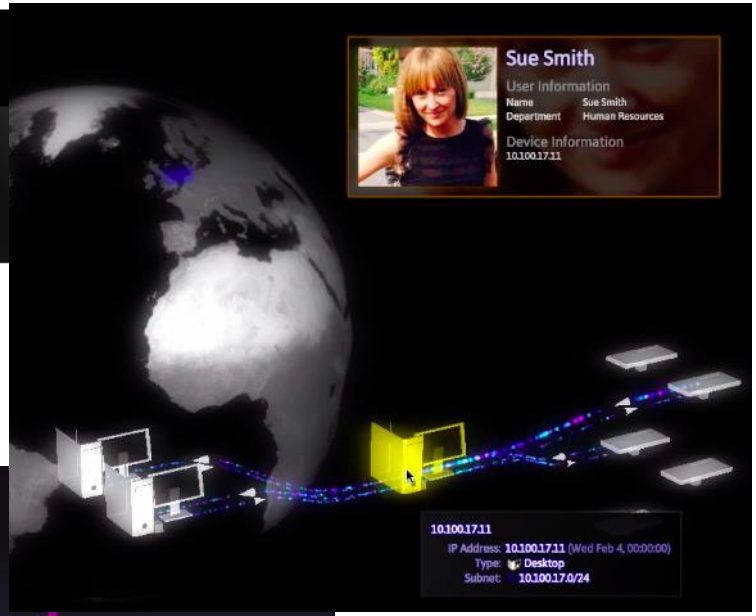


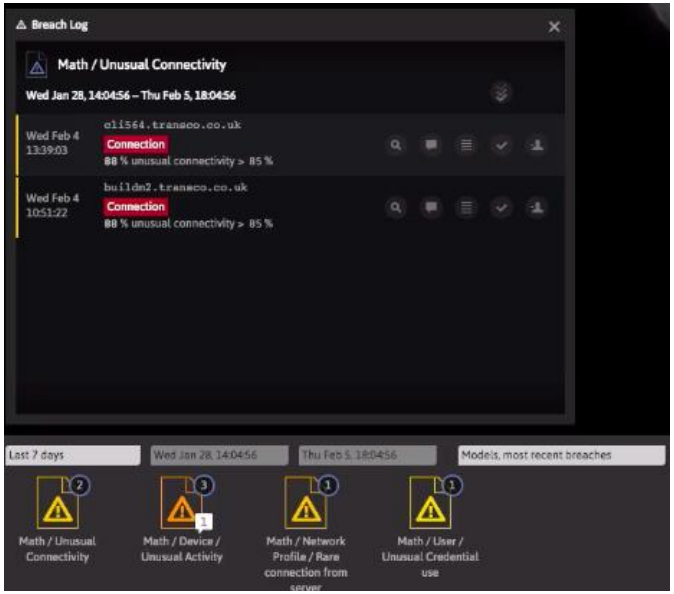
威脅視度展示 4/5

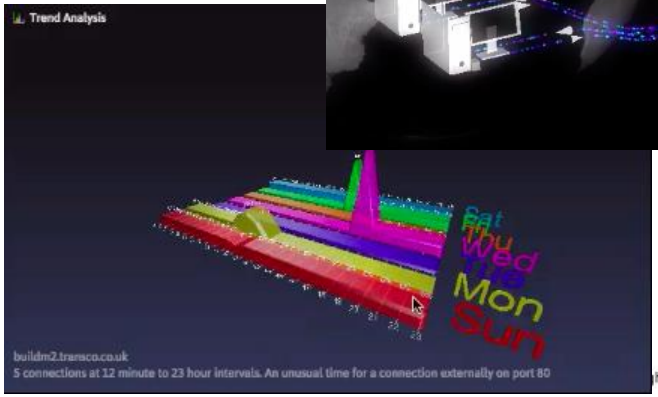


威脅視度展示 5/5









Darkflow

350 – 1,000+ measurements

Extracted from raw network traffic feeding into
Unsupervised Machine Learning Approaches

PACKET META DATA •PACKET FLOW DATA • DPI • O/S & APP FINGERPRINTING • USER ACTIONS

2 Appendices

2.1 List of metrics

Connections	The number of connections created involving the device over a period of time. The IP address, port and protocol define a connection. Every connection has an originator (source) that creates the connection, and an endpoint (destination). Generally speaking, a connection can be between two internal machines, between a machine and a public IP address, between a public IP address and an internal machine, or between a public IP address and another public IP address. In this context *device* refers to only an internal device. (DCIP does not consider www.google.com to be a device.)
External Connections	The number of connections between the device and the outside world over a period of time.
Internal Connections	The number of connections between the device and other devices on the internal network over a period of time.
Connected Devices	The number of distinct IPs (machines) the device connects to over a period of time.
External Connected Devices	The number of distinct external IPs (machines) connected to in the outside world over a period of time. Analogous to 'Connected Devices' but for external IPs.
Internal Connected Devices	The number of distinct IPs (machines) connected to within the internal network over a period of time. Analogous to 'Connected Devices' but for internal IPs.
Active Connections	The number of ongoing connections at any one time involving the device over a period of time.
Active External Connections	The number of ongoing connections at any one time between the device and the outside world over a period of time.
Active Internal Connections	The number of ongoing connections at any one time between the device and other devices on the internal network.
Data Transfer	The volume of data transferred by the device over a period of time.
External Data Transfer	The volume of data transferred between the device and the outside world over a period of time.
Internal Data Transfer	The volume of data transferred between the device and the internal network over a period of time.

Where do We fit

端末設備 （防毒、紀錄、更新） Rules & Signatures	**網路設備** （防火牆、沙箱、威脅分析） Rules, Signatures, Data-mining/ science
安全事件分析 （安全事件管理、大數據） Data-mining/ science	**整體網路環境** DARKTRACE Machine Learning

Rules and Signatures：	發掘【已知】的惡意程式以及異常行為
Data-mining/science：	提供管理同仁異常事件的關連【紀錄】
Machine learning：	實時顯示資訊網路潛藏之【異常】行為

Customer Perspectives

"Darktrace has the unique capability to detect things that happen over time."

"We have found that other products claiming to offer behavioral learning are in fact rules based, with little or no true machine learning."

"While most companies are claiming to do some correlation analysis and behavioral analysis, I have looked into their offerings and nothing comes close to Darktrace."

"We like the way that Darktrace continues to learn over time and avoids the noise."

"It's the best security technology on the market."

"I think the math algorithm is brilliant – it sold the product to me."

"I got unprecedented visibility of my network."

"No existing products on the market can do what Darktrace does."

Case Study: Drax

Industry

- Energy & utilities

Challenge

- Drax is part of critical national infrastructure
- Defense for corporate & production environments required
- Concerned about insider threat
- Needed protection about advanced threats

Benefits

- Detected threats that had bypassed other security tools
- Added Industrial Immune System to monitor Industrial Control Systems
- Continual monitoring of networks & anomalies
- Ability to investigate and mitigate threats in real time

"Darktrace's technology has identified threats with the potential to disrupt our systems"

Drax

Case Study: Virgin Trains

Industry
- Transportation

Challenge
- Cyber security named priority by Virgin Group
- Large partner base connected to network
- Increasingly wireless on trains
- Maintain customer experience while managing risk

Benefits
- Baseline of how users, devices and network operate
- Unlike SIEM tools, provides total, real-time visibility
- Able to pinpoint security spend and maximize resources
- Improved customer confidence

"Darktrace's cyber intelligence platform provide us with total visibility into what is happening in real time"

Louis Kangurs
IT Network Director, Virgin Trains

Case Study: DNK

Industry

- Insurance

Challenge

- Lead cyber security efforts in shipping industry
- Potential threats & cyber warfare against DNK's members
- Proactive defense required to anticipate problems

Benefits

- Constant monitoring of corporate network
- Ability to address security issues in real time
- Greater confidence in ability to defend against sophisticated threats and protect members
- Boost to DNK as leader in security and risk mitigation

"Darktrace detects potential issues without us having to define what we're looking for in advance or make assumptions"

Svein Ringbakken
Managing Director, DNK

Case Study: Sega Games

Industry

- Games

Challenge

- Protection against APTs
- Widespread use of social media and other data-sharing sites
- Defense of core intellectual property (games), customer data and corporate reputation

Benefits

- Adaptive monitoring
- Better understanding of dynamic digital environment
- Surfaces anomalies that would otherwise hide in Sega's busy networks
- Significant reduction in cyber risk
- More stable environment for customers, customer and digital assets

"Darktrace gives us a higher degree of confidence in our security, and that translates into a more stable environment for our staff, customers and data."

Sega

Case Study: BT

Industry

- Telecommunications

Challenge

- Large, widely dispersed network
- Fast-evolving sophisticated threats
- Wanted a solution that could parse complex network data and detect previously unknown threats

Benefits

- Real-time, dynamically updated visibility of entire network
- Confidence that previously unknown threats can be detected within network before they do serious damage
- Enhanced their own security offerings with Darktrace's expertise in unsupervised machine learning and Bayesian mathematics
- Defended against potential insider threat

"Darktrace's machine learning and mathematics are extremely powerful in detecting activity that is abnormal and will be critical to our future cyber security offerings."

Mark Hughes, President
BT Security