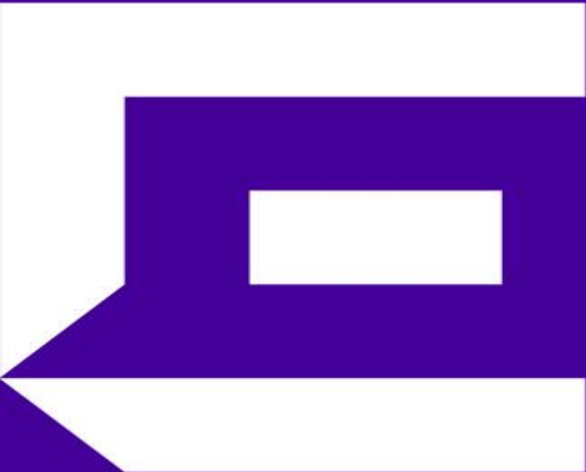




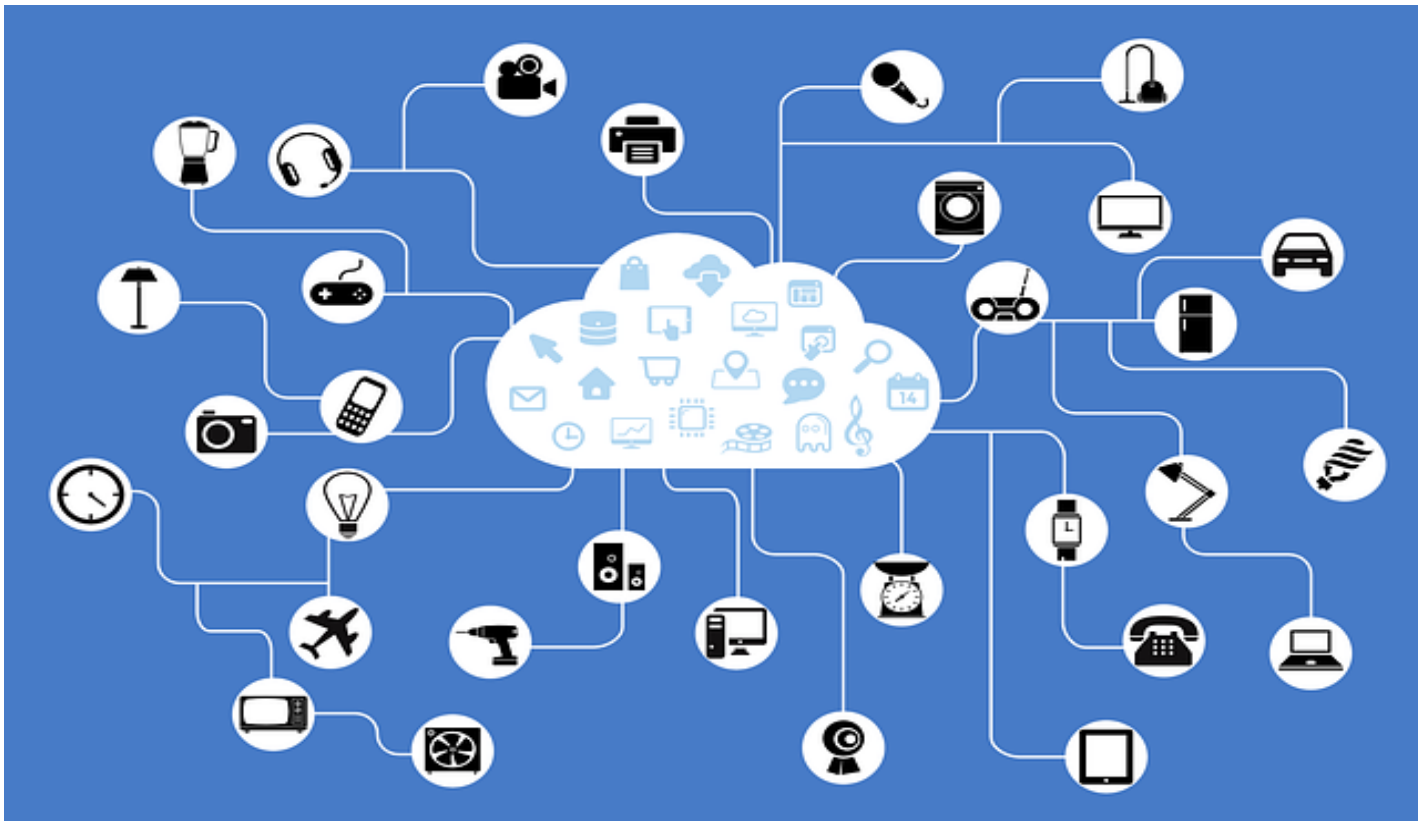
# 大物聯網時代下的有線、無線 資安革命

蘇俊銘 Kevin Su  
Extreme Networks 台灣區技術顧問

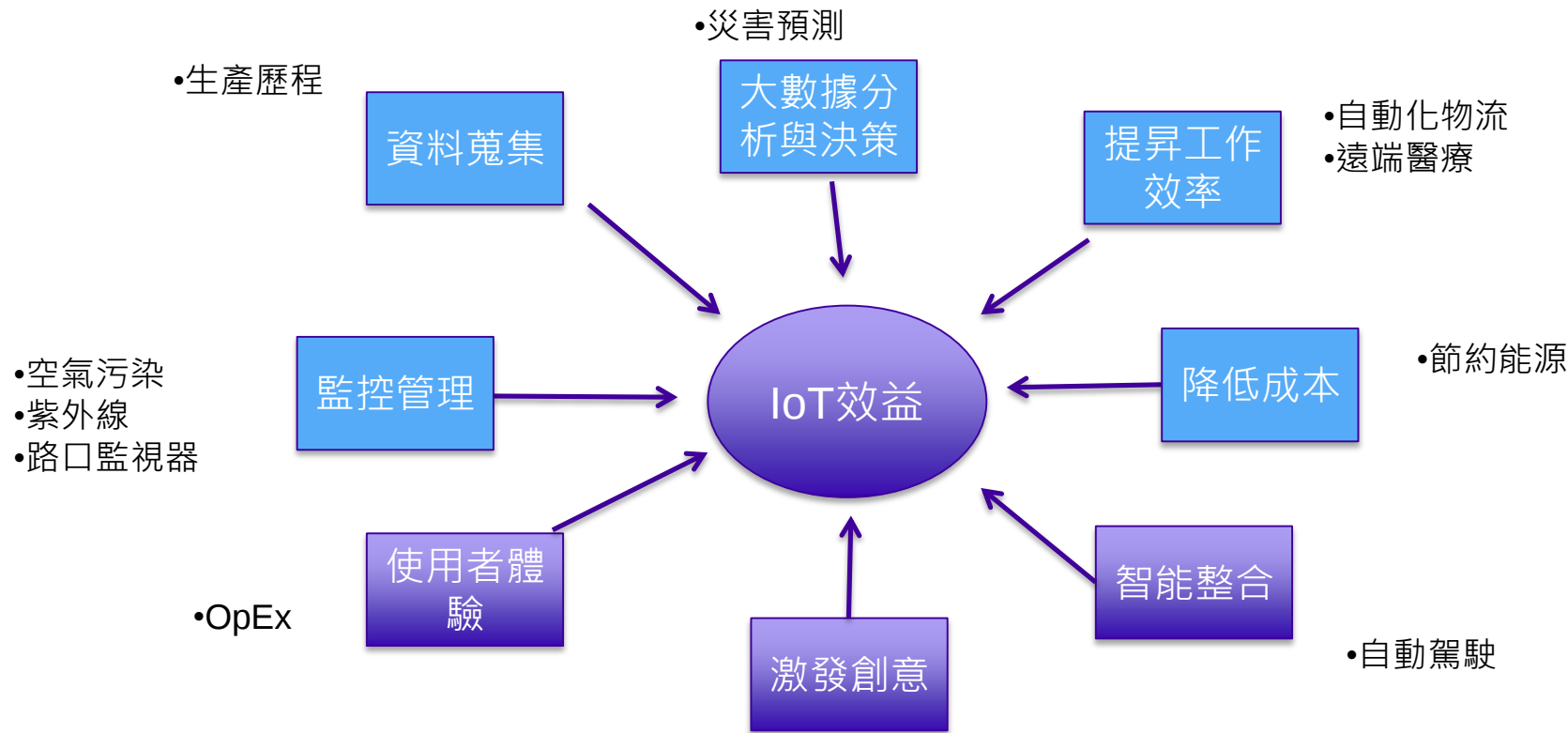
- IoT趨勢
- 校園IoT應用
- IoT面臨的安全性威脅
- 導入IoT的注意事項
- Extreme對應的解決方案
- 結論

## ■ IoT應用範圍

- 交通運輸
- 健康醫療
- 智慧建築
- 公共安全
- 智慧能源
- 零售物流
- 環境監控
- 工業製造
- 農業生產

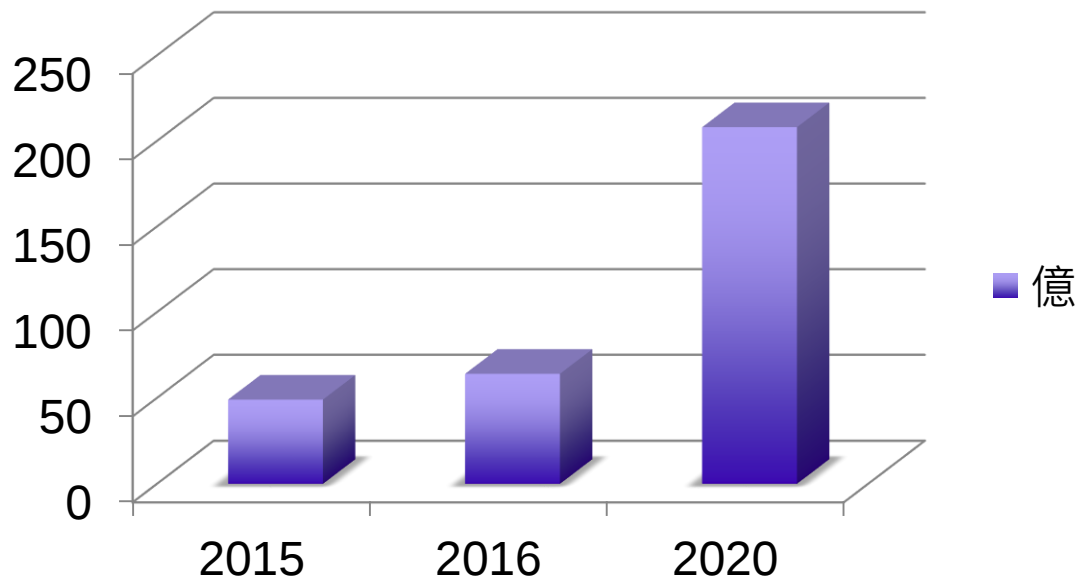


# IoT為企業帶來的效益

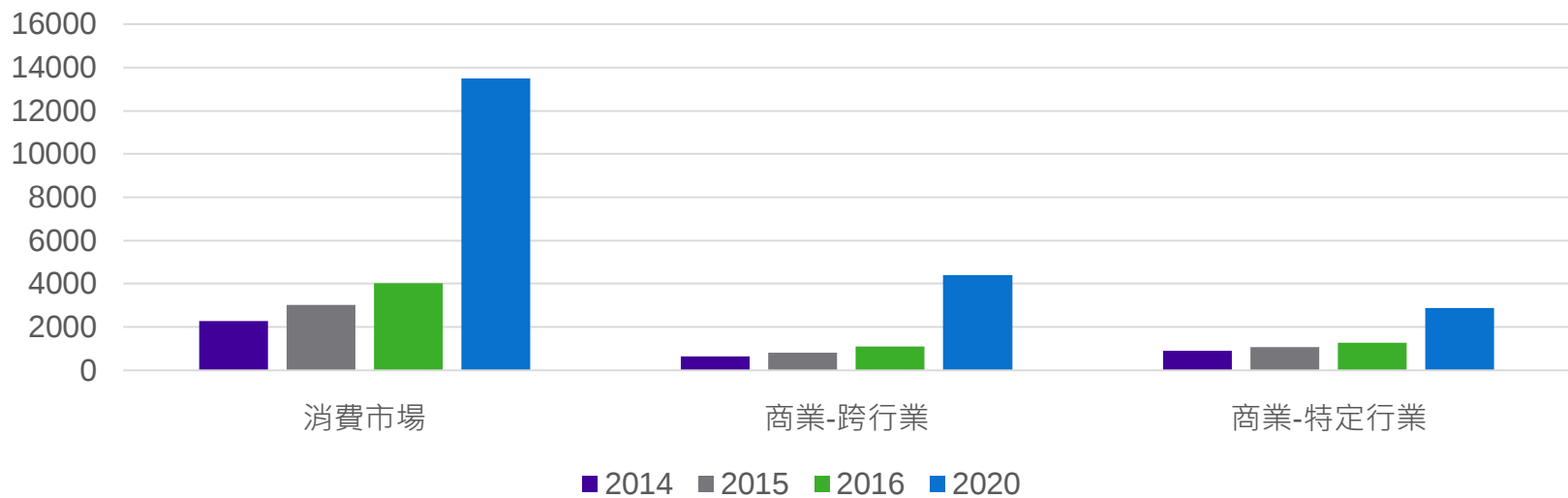


- Gardner的預測資料預估2020年時會有超過208億的物連網(IoT)裝置

## 物聯網裝置



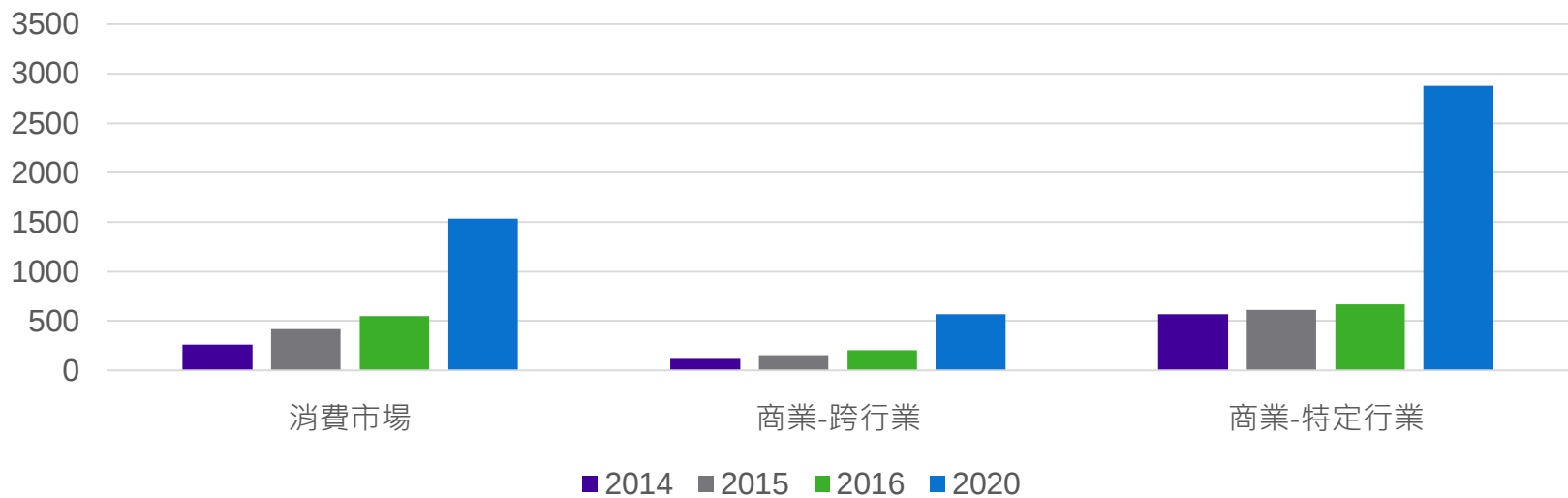
## Internet of Things Units Installed Base by Category (Millions of Units)



Source: Gartner (November 2015)

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## Internet of Things Endpoint Spending by Category (Billions of Dollars)



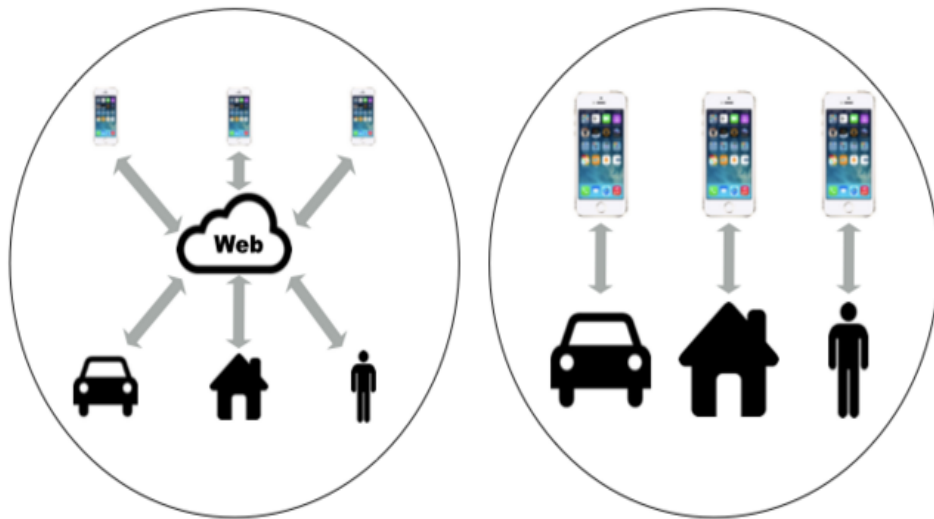
Source: Gartner (November 2015)

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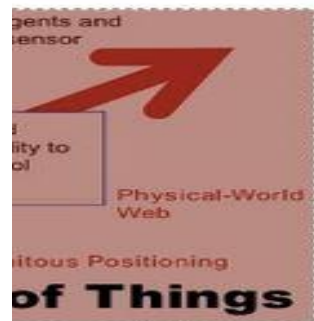
## Web of Things

使用情境

Technology Res



Source: SR



20

Time

- IoT趨勢
- 校園IoT應用
- IoT面臨的安全性威脅
- 導入IoT的注意事項
- Extreme對應的解決方案
- 結論

# Building Realtime Vehicle-Tracking Maps



# Smart Sprinkler Control

Lono lets you control your sprinkler system anywhere, anytime with your smart phone. And the things that should be automated, finally are.

<http://lono.io/>



## Kiosk



# Smart A/C

Aros learns from your budget, location, schedule, and usage to automatically maintain the perfect temperature and maximize savings for your home.



<https://www.quirky.com/shop/752-aros-smart-window-air-conditioner>





# Creating a connected classroom with IoT



Posted November 18, 2014 by Microsoft IoT



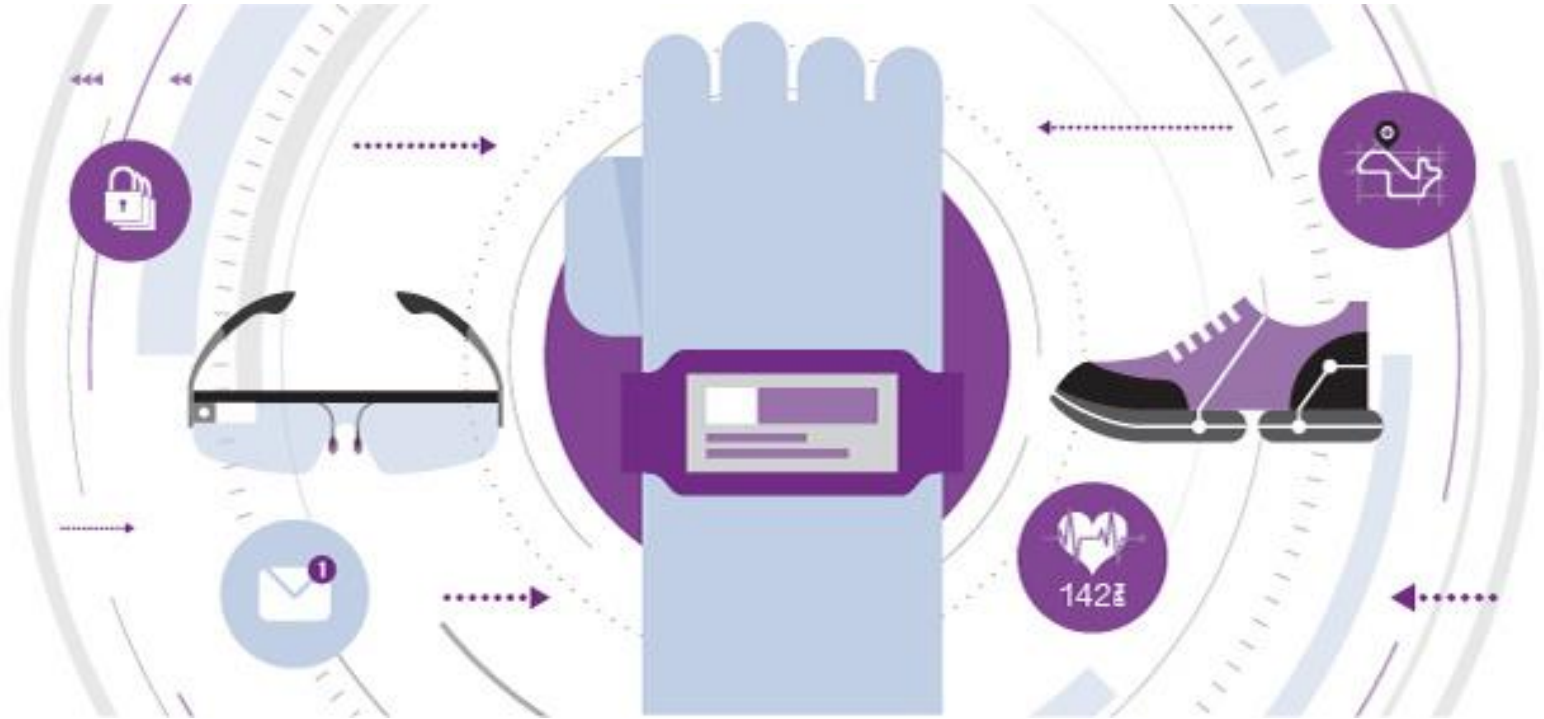
0



12



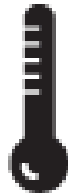






Arduino

+



Temperature  
sensor

+



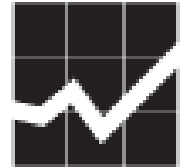
MQTT

+



Bluemix &  
IOT Foundation

=



Realtime  
graphing  
of data



# Remocam™

The first IoT security camera



We are currently on  
indiegogo campaign!  
Support us!

# Smart Garbage Cans

BigBelly alerts when it needs to be emptied so smarter collection decisions can be made.

<http://www.bigbelly.com/solutions/stations/smartbelly/>



# Smart Washing Machine

Smart Aqualtis is the first Indesit Company washing machine designed to be integrated in 'Smart' ecosystems, covering a wide range of use cases.



# Smart Mirror

A reflective mirror with programmable applications and digital display for the home, office and public environments (hotels, hospitals, retail shops).



<http://www.cybertecturemirror.com/>

# Smart Doorlock

The Genie Smart Lock - A door lock that allows you to lock and unlock your home using your smart phone, bluetooth keyring or computer.

<http://www.geniesmartlock.com/index.php>



## 可汗學院

非盈利組織

可汗學院是由孟加拉裔美國人，麻省理工學院及哈佛大學商學院畢業生薩爾曼·可汗在2006年創立的一所非營利教育機構。 [維基百科](#)



“課堂”變得更開放和學習不再被限制於課堂

- 可汗學院利用了網路傳送的便捷與錄影重複利用成本低特性。每段課程影片長度約十分鐘，從最基礎的內容開始，以由易到難的進階方式互相銜接。
- 教學者本人不出現在影片中，用的是一種電子黑板系統。
- 其網站目前也開發了一種練習系統，記錄了學習者對每一個問題的完整練習記錄，教學者參考該記錄，可以很容易得知學習者哪些觀念不懂，目前已有557個練習。傳統的学校課程中，為了配合全班的進度，教師只要求學生跨過一定的門檻（例如及格）就繼續往下教；但若利用類似於可汗學院的系統，則可以試圖讓學生懂得每一個未來還要用到的基礎觀念之後，再繼續往下教學，進度類似的學生可以重編在一班。在美國，某些學校已經導入「回家看可汗學院影片代替家庭作業，上課時則是做練習，再由老師或已懂同學去教導其他同學」這樣的教學模式。

- IoT趨勢
- 校園IoT應用
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- 結論

- 採用開放源與新的通訊協定，相較舊協定有較多的缺點及漏洞
- 製造商設計時並未考慮安全性，設備無防毒防駭機制
- 設備的數量與多樣性造成管理的複雜度
- 爆炸性的成長數量也成為駭客偵測與覬覦的目標

## Linux Flaw Affects Linux PCs, Servers, and Devices Running Android KitKat 4.4

January 21, 2016



A previously undiscovered flaw in the Linux kernel has been found, affecting “tens of millions” of Linux PCs and servers. According to researchers, the bug allows attackers to escalate local user privileges to the highest root level, and also affects devices running Android KitKat 4.4 and higher. The flaw, which dates back to 2012, affects Linux kernel versions 3.8 and later, and is found in the keyring facility where apps are allowed to store encryption keys, authentication tokens, and other sensitive security data. Once exploited, attackers could execute code on the Linux kernel and extract cached security data. As of disclosure date, security teams are investigating potentially affected devices.



<http://www.trendmicro.com.my/vinfo/my/security/news/vulnerabilities-and-exploits/linux-flaw-affects-pcs-servers-and-android-kitkat>

- 是的，您沒看錯，您必須同時修補您的伺服器、手機和物聯網 (IoT) 裝置才能完全防堵這個漏洞。
- 這是一個由 Perception Point 研究團隊所揭露的 Linux 核心漏洞 (CVE-2016-0728)。Linux 核心是所有 Linux 作業系統的共同元件，而 Linux 系統又廣泛運用在今日的許許多多裝置。由於 Linux 不僅用於伺服器平台，就連 Android 手機、平板和各式各樣的 IoT 裝置都是使用 Linux 系統，因此 Linux 核心漏洞的影響層面非常廣泛。
- 此次出現的是一個提升本機權限的漏洞，光就它本身來看並不算是個嚴重的問題，但提升本機權限的漏洞可能搭配其他的漏洞 (尤其是應用程式漏洞) 來發動更嚴重的攻擊。
- 根據 Perception Point 研究團隊的說法，此漏洞大約影響全球 66% 的 Android 裝置。至於 IoT 裝置所受到的影響情況則不明朗。
- 此漏洞對 Android 和 IoT 裝置來說，最重要的問題還是在於如何取得系統更新。受此漏洞影響的大部分 Android 和 IoT 裝置很可能一輩子也無法獲得更新，所以此漏洞將永遠存在。
- Linux 核心目前已修正此漏洞，而 Linux 各主要發行版本也都已經有了對應的修補程式，所以，可以的話您還是應該更新您的伺服器。
- 至於受影響的 Android 手機、平板和 IoT 裝置，還是只能看看廠商是否能夠提供更新了。

# Google Android作業系統的漏洞

## Google » Android : Vulnerability Statistics

[Vulnerabilities \(187\)](#) [CVSS Scores Report](#) [Browse all versions](#) [Possible matches for this product](#) [Related Metasploit Modules](#)

[Related OVAL Definitions](#) : [Vulnerabilities \(7\)](#) [Patches \(12\)](#) [Inventory Definitions \(0\)](#) [Compliance Definitions \(0\)](#)

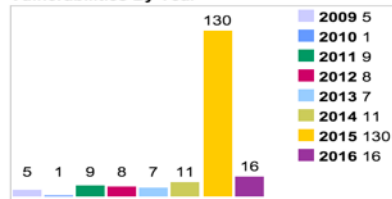
[Vulnerability Feeds & Widgets](#)

### Vulnerability Trends Over Time

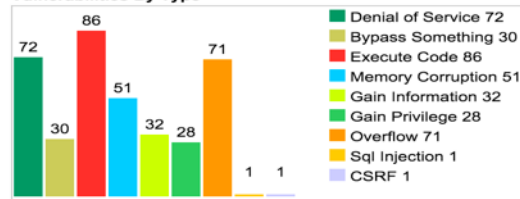
| Year                 | # of Vulnerabilities | DoS                | Code Execution     | Overflow           | Memory Corruption  | Sql Injection     | XSS | Directory Traversal | Http Response Splitting | Bypass something   | Gain Information   | Gain Privileges    | CSRF              | File Inclusion | # of exploits     |
|----------------------|----------------------|--------------------|--------------------|--------------------|--------------------|-------------------|-----|---------------------|-------------------------|--------------------|--------------------|--------------------|-------------------|----------------|-------------------|
| <a href="#">2009</a> | 5                    | <a href="#">3</a>  |                    |                    |                    |                   |     |                     |                         | <a href="#">1</a>  |                    |                    |                   |                |                   |
| <a href="#">2010</a> | 1                    | <a href="#">1</a>  | <a href="#">1</a>  |                    |                    |                   |     |                     |                         |                    |                    |                    |                   |                |                   |
| <a href="#">2011</a> | 9                    | <a href="#">1</a>  | <a href="#">1</a>  |                    | <a href="#">1</a>  |                   |     |                     |                         | <a href="#">3</a>  | <a href="#">2</a>  | <a href="#">3</a>  |                   |                |                   |
| <a href="#">2012</a> | 8                    | <a href="#">5</a>  | <a href="#">4</a>  | <a href="#">2</a>  |                    |                   |     |                     |                         |                    | <a href="#">1</a>  |                    |                   |                | <a href="#">1</a> |
| <a href="#">2013</a> | 7                    | <a href="#">1</a>  | <a href="#">2</a>  | <a href="#">2</a>  | <a href="#">2</a>  |                   |     |                     |                         | <a href="#">1</a>  | <a href="#">1</a>  | <a href="#">3</a>  |                   |                |                   |
| <a href="#">2014</a> | 11                   | <a href="#">1</a>  | <a href="#">4</a>  | <a href="#">1</a>  |                    | <a href="#">1</a> |     |                     |                         | <a href="#">1</a>  | <a href="#">2</a>  | <a href="#">1</a>  |                   |                |                   |
| <a href="#">2015</a> | 130                  | <a href="#">56</a> | <a href="#">73</a> | <a href="#">65</a> | <a href="#">47</a> |                   |     |                     |                         | <a href="#">22</a> | <a href="#">22</a> | <a href="#">16</a> | <a href="#">1</a> |                |                   |
| <a href="#">2016</a> | 16                   | <a href="#">4</a>  | <a href="#">1</a>  | <a href="#">1</a>  | <a href="#">1</a>  |                   |     |                     |                         | <a href="#">2</a>  | <a href="#">4</a>  | <a href="#">5</a>  |                   |                |                   |
| Total                | 187                  | <a href="#">72</a> | <a href="#">86</a> | <a href="#">71</a> | <a href="#">51</a> | <a href="#">1</a> |     |                     |                         | <a href="#">30</a> | <a href="#">32</a> | <a href="#">28</a> | <a href="#">1</a> |                | <a href="#">1</a> |
| % Of All             |                      | 38.5               | 46.0               | 38.0               | 27.3               | 0.5               | 0.0 | 0.0                 | 0.0                     | 16.0               | 17.1               | 15.0               | 0.5               | 0.0            |                   |

Warning : Vulnerabilities with publish dates before 1999 are not included in this table and chart. (Because there are not many of them and they make the page look bad; and they may not be actually published in those years.)

Vulnerabilities By Year



Vulnerabilities By Type



# Apple iOS作業系統的漏洞

## Apple » iPhone Os : Vulnerability Statistics

[Vulnerabilities \(817\)](#) [CVSS Scores Report](#) [Browse all versions](#) [Possible matches for this product](#) [Related Metasploit Modules](#)

[Related OVAL Definitions](#) : [Vulnerabilities \(127\)](#) [Patches \(72\)](#) [Inventory Definitions \(0\)](#) [Compliance Definitions \(0\)](#)

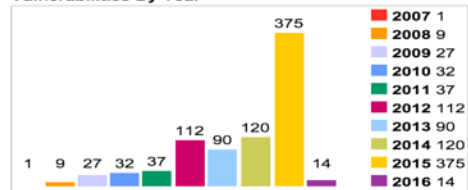
[Vulnerability Feeds & Widgets](#)

### Vulnerability Trends Over Time

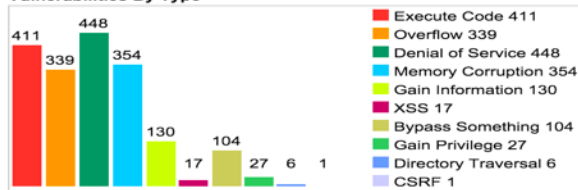
| Year     | # of Vulnerabilities | DoS  | Code Execution | Overflow | Memory Corruption | Sql Injection | XSS | Directory Traversal | Http Response Splitting | Bypass something | Gain Information | Gain Privileges | CSRF | File Inclusion | # of exploits |
|----------|----------------------|------|----------------|----------|-------------------|---------------|-----|---------------------|-------------------------|------------------|------------------|-----------------|------|----------------|---------------|
| 2007     | 1                    |      | 1              | 1        |                   |               |     |                     |                         |                  |                  |                 |      |                |               |
| 2008     | 9                    | 3    | 2              |          | 1                 |               |     |                     |                         |                  | 2                |                 |      |                |               |
| 2009     | 27                   | 10   | 6              | 2        | 4                 |               | 2   |                     |                         | 3                | 2                |                 |      |                | 3             |
| 2010     | 32                   | 14   | 14             | 9        | 6                 |               |     |                     |                         | 5                | 3                | 2               |      |                | 3             |
| 2011     | 37                   | 13   | 10             | 5        | 6                 |               | 3   |                     |                         | 2                | 11               | 1               |      |                |               |
| 2012     | 112                  | 74   | 69             | 63       | 60                |               | 7   |                     |                         | 13               | 9                | 1               |      |                |               |
| 2013     | 90                   | 52   | 44             | 36       | 41                |               | 4   |                     |                         | 17               | 9                | 1               |      |                |               |
| 2014     | 120                  | 48   | 50             | 35       | 33                |               | 1   | 1                   |                         | 20               | 25               | 4               |      |                |               |
| 2015     | 375                  | 222  | 210            | 176      | 191               |               |     | 5                   |                         | 44               | 61               | 13              | 1    |                | 1             |
| 2016     | 14                   | 12   | 5              | 12       | 12                |               |     |                     |                         |                  | 3                | 5               |      |                |               |
| Total    | 817                  | 448  | 411            | 339      | 354               |               | 17  | 6                   |                         | 104              | 130              | 27              | 1    |                | 7             |
| % Of All |                      | 54.8 | 50.3           | 41.5     | 43.3              | 0.0           | 2.1 | 0.7                 | 0.0                     | 12.7             | 15.9             | 3.3             | 0.1  | 0.0            |               |

Warning : Vulnerabilities with publish dates before 1999 are not included in this table and chart. (Because there are not many of them and they make the page look bad; and they may not be actually published in those years.)

Vulnerabilities By Year



Vulnerabilities By Type



[Home](#) > [Microsoft Subnet](#)

### PRIVACY AND SECURITY FANATIC

By [Ms. Smith](#) | [Follow](#)

#### About



Ms. Smith (not her real name) is a freelance writer and programmer with a special and somewhat personal interest in IT privacy and security issues.

# Hacks to turn your wireless IP surveillance cameras against you

Thousands of wireless IP cameras are vulnerable to remote attacks. At Hack in the Box security conference, researchers showed how to exploit the devices in "To Watch or Be Watched: Turning Your Surveillance Camera Against You" and released a tool to automate attacks.

Network World | Apr 14, 2013 1:18 PM PT

#### RELATED

Widely used wireless IP cameras open to hijacking over the Internet,...

Hackers steal photos, turn Wi-Fi cameras into remote surveillance device

Kaspersky Lab launches world's first anti-malware product for UEFI

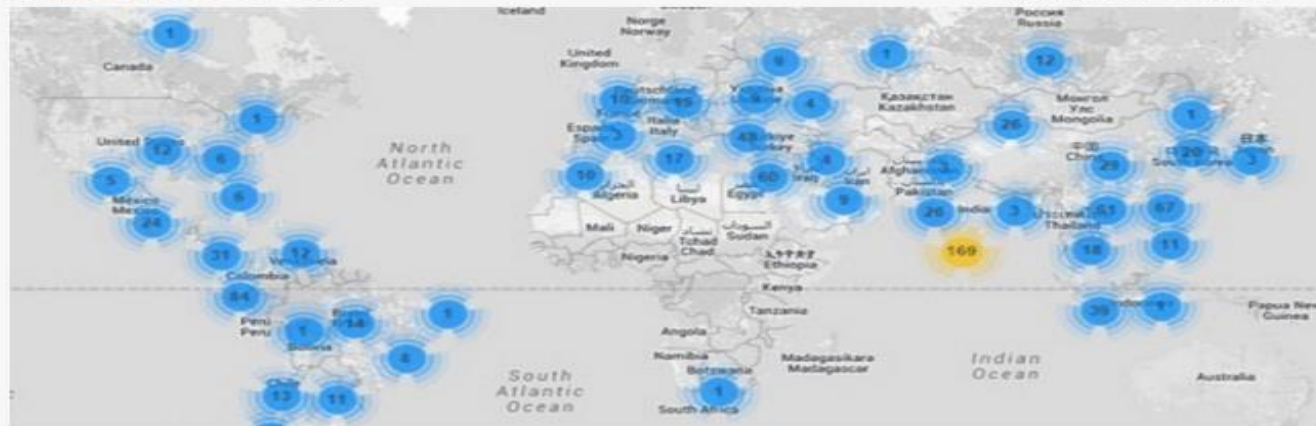
新聞

## Imperva：駭客以監視器攝影機組成殭屍網路，發動DDoS攻擊

資安業者Imperva發現一個由監視器攝影機組成的殭屍網路，而且駭客利用此一殭屍網路針對某一雲端服務發動了分散式阻斷服務攻擊（DDoS），突顯了物聯網時代所面臨的安全問題。

文/ 陳曉莉 | 2015-10-23 發表

按讚加入iThome粉絲團



資安業者Imperva指出，他們發現一個由監視器攝影機組成的殭屍網路，而且駭客利用此一殭屍網路針對某一雲端服務發動了分散式阻斷服務攻擊（DDoS），突顯了物聯網（IoT）時代所面臨的安全問題。



### 熱門新聞

群暉DSM 6測試版新增多  
租戶架構Docker化NAS  
2015-11-08

富士全錄新型複合機無須  
列印伺服器，1機可管50  
臺網路印表機  
2015-11-08

Surface Pro 4上市前搶先  
曝光，台灣微軟將引進5款  
機型  
2015-11-06

一周大事

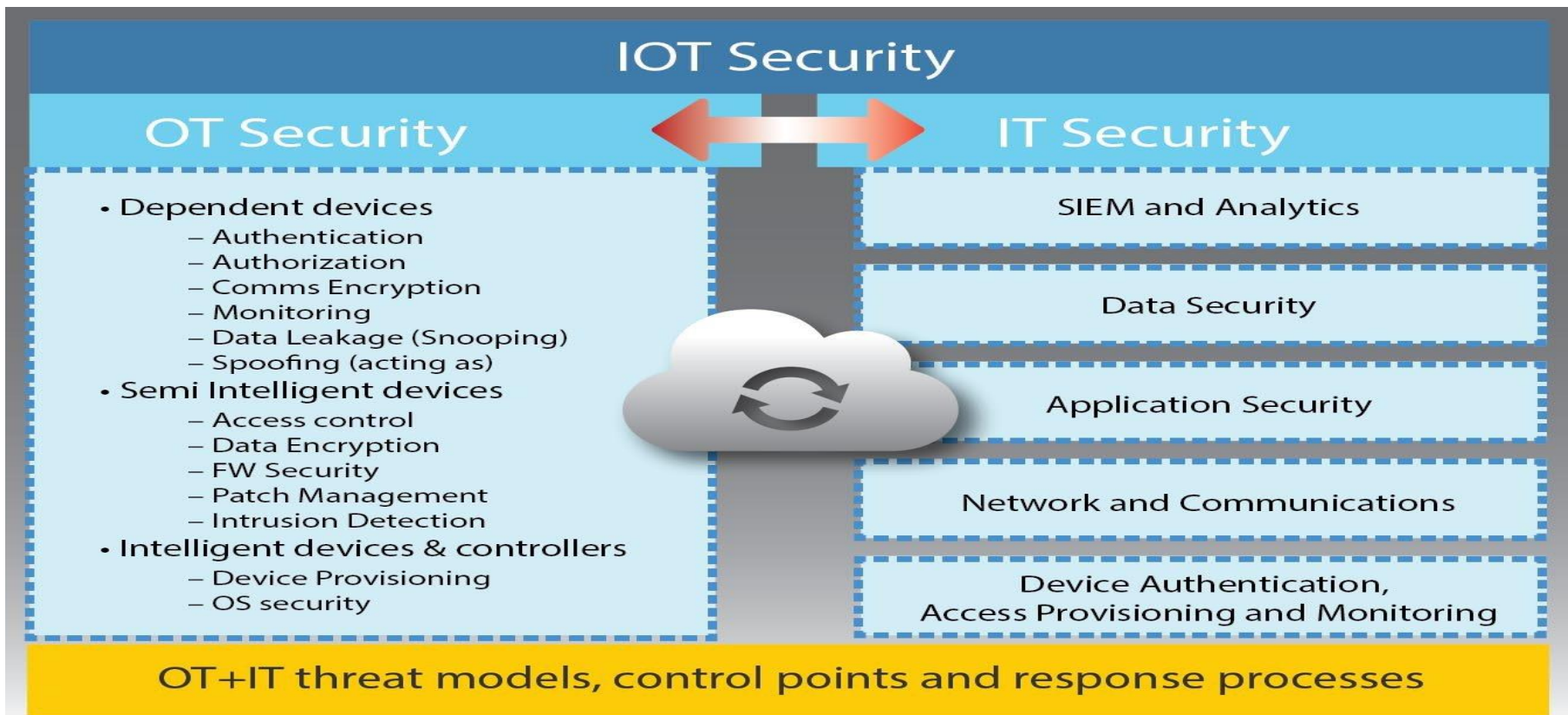
# 駭客入侵雲端服務業者來竊取資料



- IoT趨勢
- 校園IoT應用
- IoT面臨的安全性威脅
- 導入IoT的注意事項
- Extreme對應的解決方案
- 結論

- 當IoT裝置以倍數成長及對於無線網路使用的依賴程度越來越高，無線網路的設計不再是以涵蓋率為考量，而是需要依使用密度，IoT應用類型頻寬來佈建無線基地台
- 慎選IoT裝置供應商除了功能面，評估該廠商對裝置漏洞處理的能力
- IoT裝置更新的複雜性與需發費的時間需列入考量
- IoT裝置本身的安全性必須納入考量，例如使用更嚴格的加密、更高強度的密碼、隨時保持裝置OS軟體更新等等。
- 網路設計透過不同網段或不同SSID來區隔服務已經不敷安全性上的需求，必須結合認證機制及動態授權能力，嚴加控管不同IoT的服務內容，避免IoT裝置上面不必要的開放連接埠，既要保護使用者、且不能犧牲裝置的功能性。
- 具備有線/無線集中控管能力的網路，可提供相同的使用經驗及安全性政策。
- 具備即時監視及控制IoT狀態與行為的能力，軌跡資訊也應使用單一資料庫，可快速追蹤使用者/IoT裝置以簡化將來Big Data 資料分析的關聯性

# IoT Security = OT Security + IT Security



- IoT趨勢
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- IoT面臨的安全性威脅
- 導入IoT的注意事項
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- 結論

- 無線網路需支援高密度的使用環境
- IoT/BYOD裝置的定位與追蹤
- 無線網路的安全性強化 ( RF干擾及入侵偵測 )
- 所有IoT設備、使用者行為的可視性
- 動態與即時的網路及存取資源配置
- 具備集中管理有線/無線能力
- 大量資料中心儲存系統及高速網路



- 支援高密度及高效能的無線網路
- 支援無線定位與追蹤系統
- 安全性(認證機制、入侵防禦系統、頻譜分析)
- BYOD/物聯網裝置控管
- 自動化(訪客自我註冊、網路自動管理)
- 流量可視性(大數據分析)

- 早期無線網路存取的提供，大都是附加價值或加值服務，所以建置的要求以涵蓋率為主，因此建置的方式大都以不更動既有架構的前提下進行，所以tunnel及NAT的功能為市場主流。
- 隨著**AP**技術的演進，現在無線的存取服務在很多客戶的環境有取代有線的網路的趨勢，使用者密度及效能面的考量變成主要的需求，傳統tunnel跟NAT的架構反而限制了整體無線網路的效能。
- **Thin AP**架構下的設計，尤其是802.11ac及未來的 802.11ad，WLAN controller形成瓶頸點。
- 應用場合大都以餐廳、會議室、禮堂、運動場、教室...等使用者密集的機會為主，但往後隨著**IoT**應用的普及和使用者使用超過兩個以上的行動設備（手機、平板、NB、穿戴式裝置），因此高密度的無線設備的連線需求，隨處可見！

# Extreme 高密度用戶及高效能無線網路實績

- Number of deployed stadiums
  - 9 NFL Stadiums and 1 Collegiate Stadium with ExtremeWireless Solutions
  - 14 NFL Stadiums with Extreme Application Analytics Solution
- 6700 ExtremeWireless AP's installed at stadiums
- 1,003,382 users at football stadiums powered by ExtremeWireless
- 15,876 is the average number of unique, simultaneous wireless users per NFL game
- 544 Mbps is the average wireless bandwidth



New England Patriots



Philadelphia Eagles



Tennessee Titans



Jacksonville Jaguars



Cincinnati Bengals



Seattle Seahawks



Baltimore Ravens



Green Bay Packers



Buffalo Bills



Galaxy Macau



Diamond Light



Mount Union College



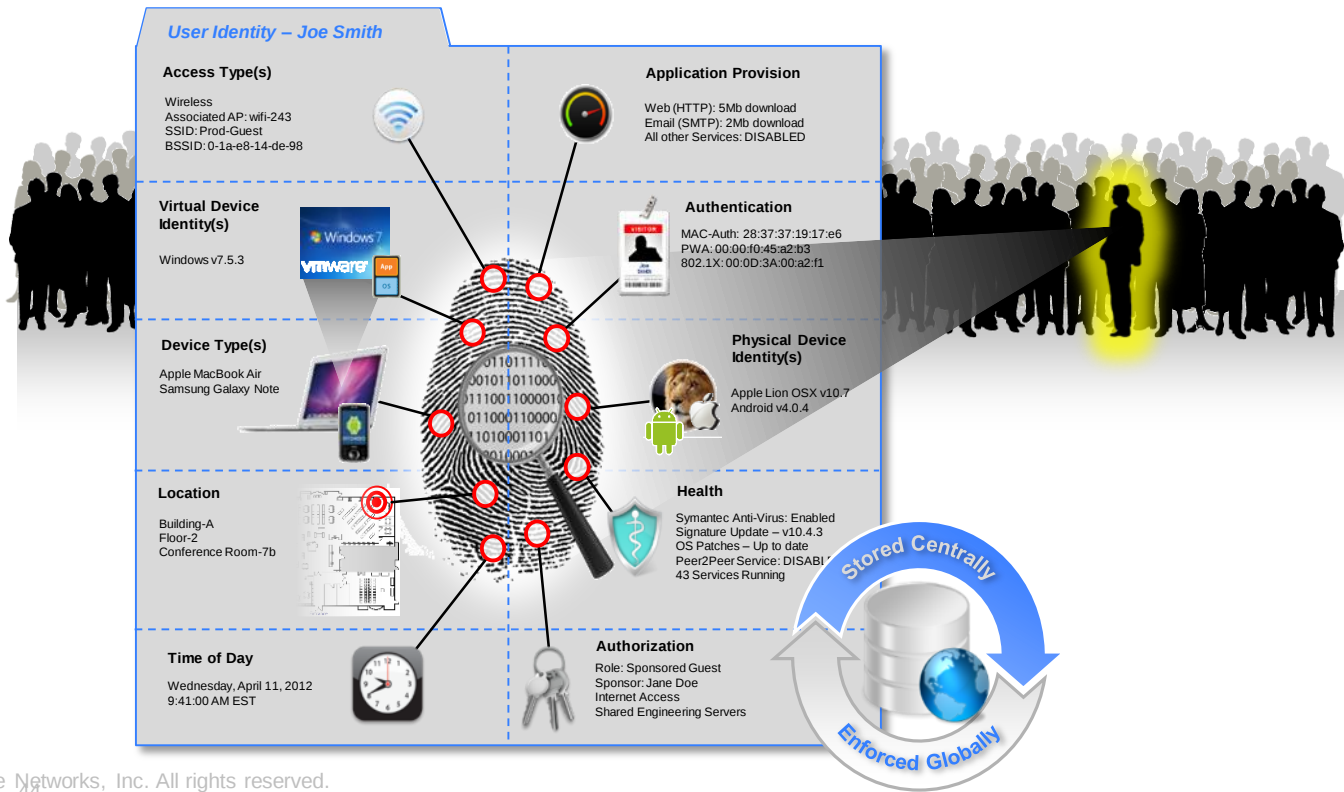
Baylor Bears



NextGen.Net

# Extreme IAC - 安全性 ( 認證、授權、稽核 )

人、事、時、地、物，超過46種屬性來決定使用者/IoT裝置權限



- WIPS / WIDS 無線頻道掃描，  
降低網管人員 debug 困擾
- 進階頻譜掃瞄與辨別
  - 偵測辨別各種無線干擾源 ( 如：  
微波/藍芽/等 )
- Rogue AP 與無線攻擊行為  
偵測與防禦



## Maps – 使用者位置歷史紀錄

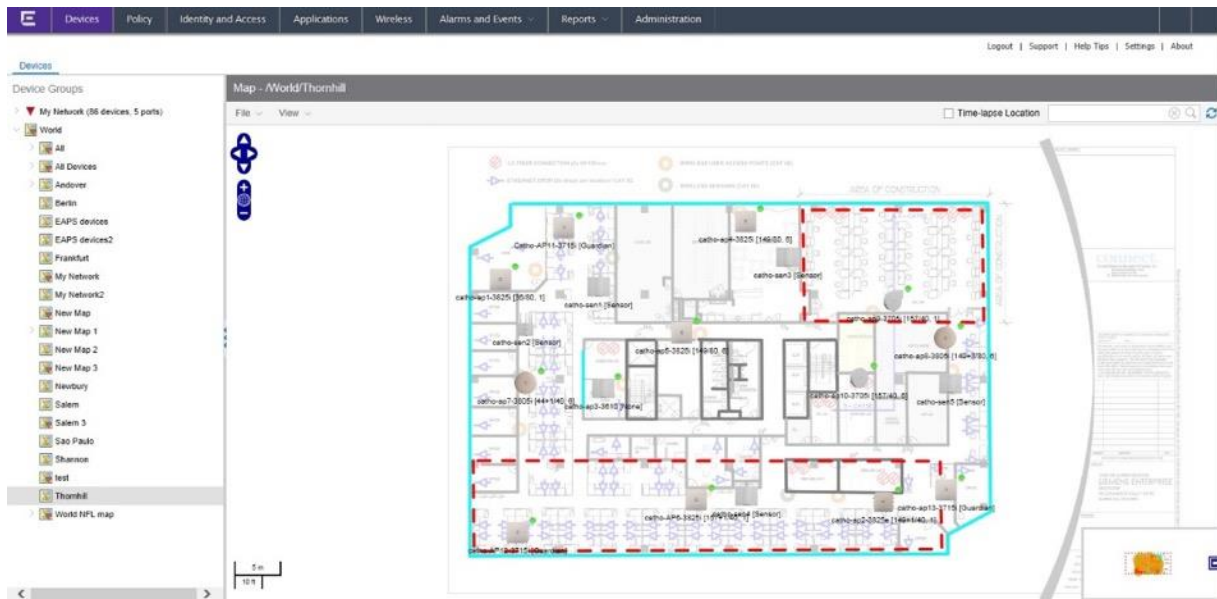
- Understand a wireless client's movement through the network
  - Search for clients by:
    - Username
    - Hostname
    - MAC
    - IP
- Allows better network troubleshooting



Jim in the  
EBC at  
10:04 AM

Jim with  
engineerin  
g at 10:06  
AM



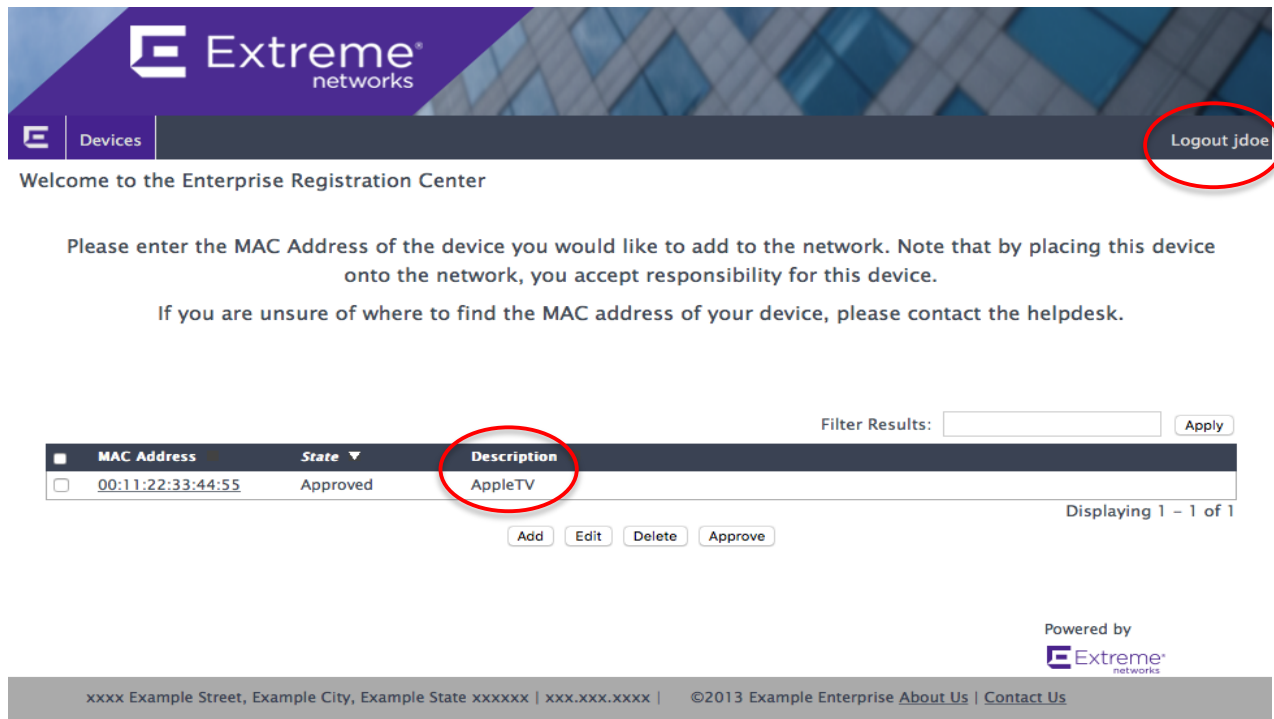


- Extreme 三點定位可提供使用者/IoT裝置定位，威脅 / Rogue AP 定位
- Extreme Area Notification可以偵測IoT裝置被移出指定位置後告警

- 簡單易用，適用於有線及無線的環境
- 適合多種情境
  - 使用者SSO認證-帳密 + 802.1x
  - 使用者/訪客網頁註冊
  - Facebook註冊
  - 裝置認證 – MAC + Location
  - BYOD - 帳密+Device Type + Location
  - IoT裝置 - OS+MAC
  - 穿戴式裝置 – 自我註冊Portal



- 自我註冊IoT設備
- 可追蹤該IoT裝置的使用者
- 可限制使用者可註冊最大的設備數量
- 自用者可管理自己的IoT設備
- 無需管理者介入



Extreme networks

Devices Logout jdoe

Welcome to the Enterprise Registration Center

Please enter the MAC Address of the device you would like to add to the network. Note that by placing this device onto the network, you accept responsibility for this device.

If you are unsure of where to find the MAC address of your device, please contact the helpdesk.

Filter Results:  Apply

| MAC Address                                | State    | Description |
|--------------------------------------------|----------|-------------|
| <input type="checkbox"/> 00:11:22:33:44:55 | Approved | AppleTV     |

Displaying 1 - 1 of 1

Add Edit Delete Approve

Powered by Extreme networks

xxxx Example Street, Example City, Example State xxxxxx | xxx.xxx.xxx | ©2013 Example Enterprise About Us | Contact Us



## 單一SSID配置，減少網路使用者困擾



# ExtremeControl - 圖型介面設定Role及套用即生效的Policy

IoT裝置的數量眾多，一定要有個可以集中修改有線/無線Policy及即時套用存取權限的能力

The screenshot displays the ExtremeControl web interface. The top navigation bar includes tabs for Devices, Policy \*, Identity and Access, Applications, Wireless, Alarms and Events, Reports, and Administration. The main content area is titled "Role: IoT-AC" and shows the configuration for this role. The left sidebar lists various roles, with "IoT-AC" highlighted. The right pane shows the "General" tab for the IoT-AC role, including fields for Name, Description, and TCI Overwrite, as well as Default Actions for Access Control and Class of Service. Below this, a table lists services associated with the role, including Deny Spoofing and Other Administrative Protocols, Deny Unsupported Protocol Access, IoT Service, and Threat Management. The bottom status bar shows the last updated time and uptime.

Domain: Default Policy Domain - Under edit by root (Modified Locally)

Roles/Services

- Roles
  - Administrator
  - Assessing
  - Deny Access
  - Enterprise Access
  - Enterprise User
  - Enterprise
  - Guest Access
  - IoT-AC**
  - IoT-Build
  - IoT-Camera
  - IoT-Kiosk
  - Notification
  - Quarantine
  - Unregistered
- Service Repository
  - Local Services
    - Service Groups
    - Services
      - Active Directory Services
      - Application Provisioning - Ba...

Class of Service

VLANs

Network Resources

Devices

Role: IoT-AC

General | VLAN Egress | Mappings

Name: IoT-AC

Description:

TCI Overwrite: Disabled

Default Actions

Access Control: Contain to VLAN

Contain to VLAN: 3[Edge]

Class of Service: Critical Data [Static]

Show All

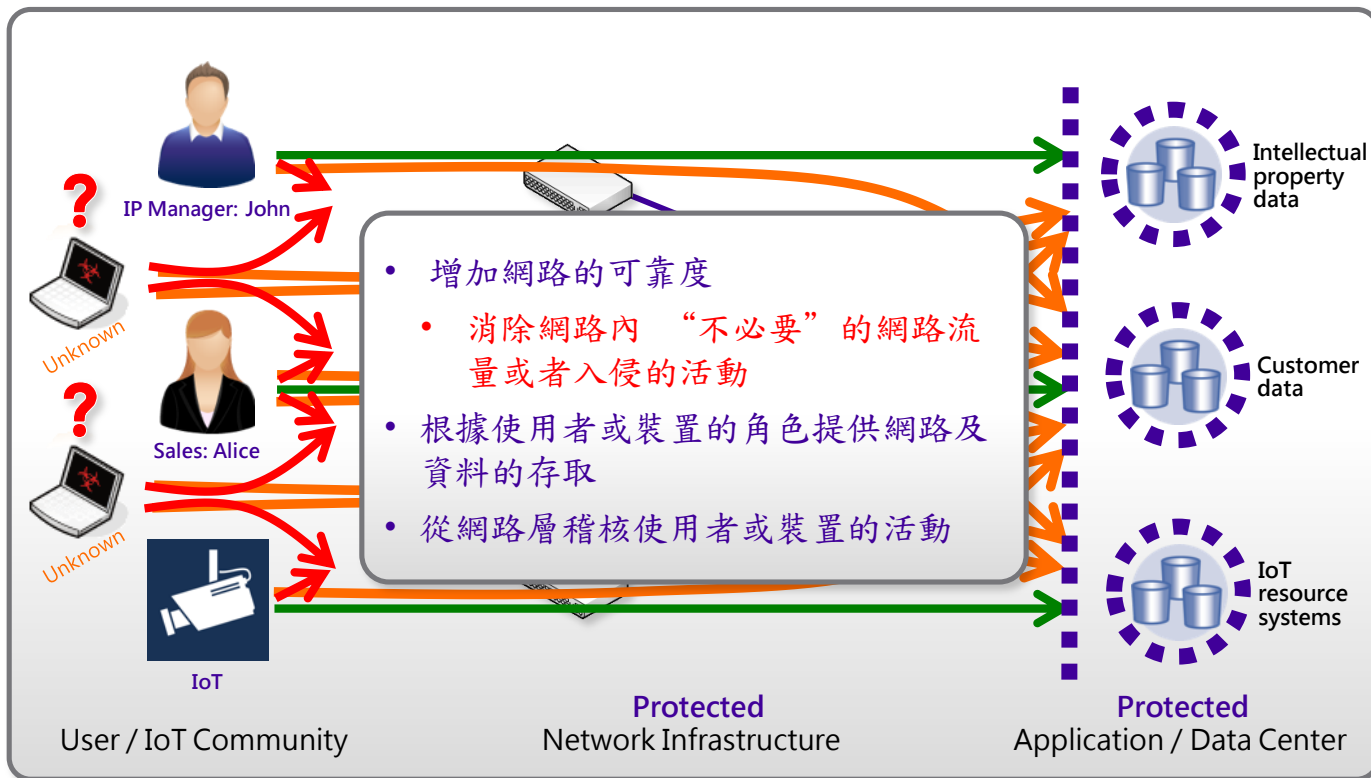
Services

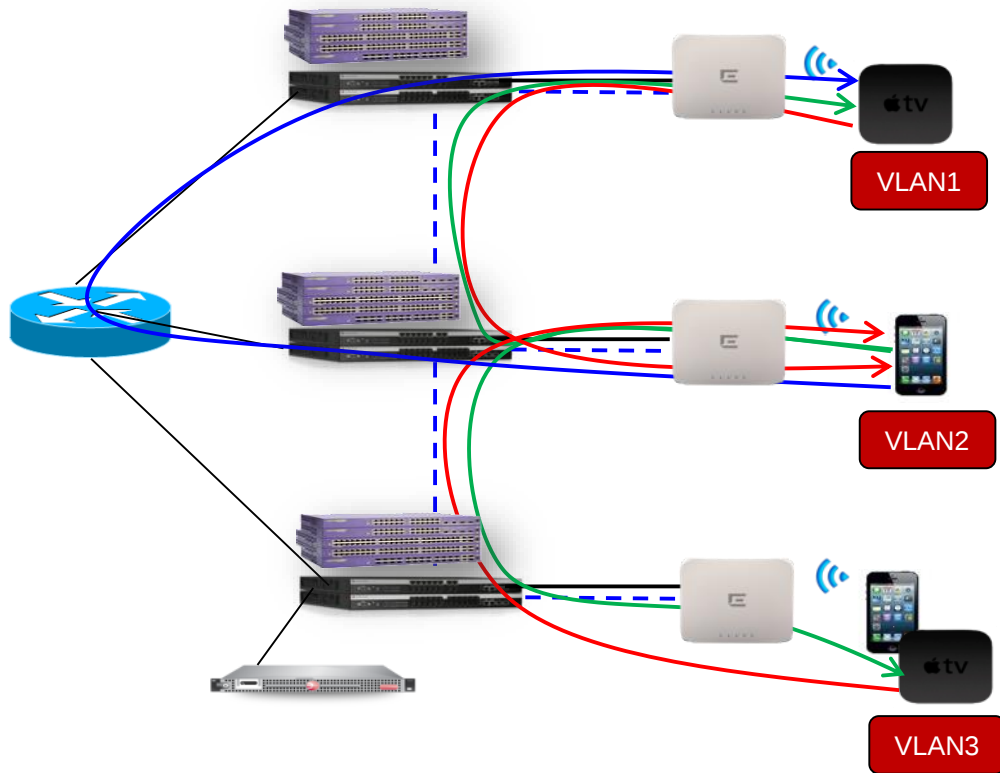
| Name                                             | Also Used By Roles |
|--------------------------------------------------|--------------------|
| Deny Spoofing and Other Administrative Protocols | Notification       |
| Deny Unsupported Protocol Access                 | Notification       |
| IoT Service                                      |                    |
| Threat Management                                | Notification       |

[ NetSight Administrator/root ] Last Updated: 2/22/2016 1:39:30 PM Uptime: 7 Days 01:22:21

Alarms: 0 1 0 0

- IoT Role :
  - 只能與其特定伺服器溝通 ( 上下載資料 )
  - 禁止IoT Role非必要的網路埠 ( IoT的個人防火牆 )
  - 禁止IoT裝置間直接溝通 ( 可避免被駭的IoT影響其他的IoT )
  - 限制IoT角色可使用頻寬 ( 保持其應有的頻寬，降低有可能IoT成為攻擊來源造成其他設備的影響 )
- IoT Manager :
  - 不同的IoT Manager只能管理自己負責的IoT裝置
- IoT + Location :
  - 監控IoT設備是否被移動，當設備被移出指定區域可通知管理者
- BYOD = Role :
  - 不同的Role有不同的資源存取權限，如總務的帳號不能用辦公室內以外的裝置如PC、平板登入財會系統
- BYOD + Location = Changable Role Policy :
  - 學生可以在教室內存取電子白板教學系統，在教室以外的地方如體育場或宿舍則不行





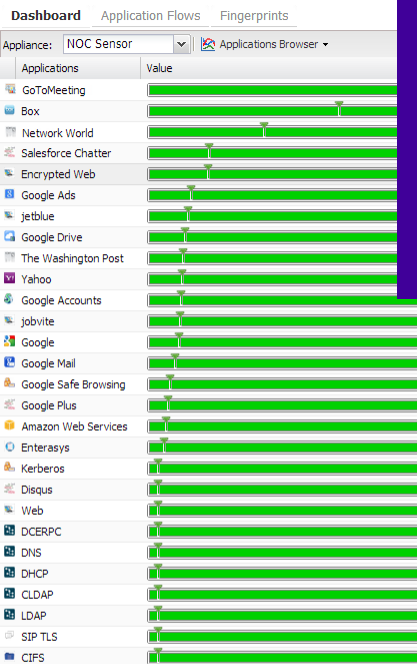
- 根據流量的類型將封包送到指定的VLAN
- 相容於任何品牌的有線網路環境
- 可控制multicast的流量
- 沒有單點失效的風險
- 沒有擴充的瓶頸點
  
- 多媒體應用
- 數位教學、電子白板畫面的分享
- 一般教室及電腦教室
- 會議室

## 越來越多的資訊透過網路傳遞

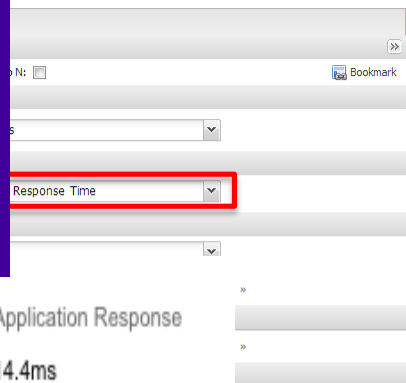
- 如何預見網路資源的分配？
- 如何優化網路的架構？
- 如何提供更好的內部及外部使用者的使用經驗？
- 如何從中獲得更多的可用資訊提供決策判斷？

# Start Troubleshooting in the Right Place

## Application Response Time: 透過網路回應時間與應用 回應時間快速定位問題點



| Application         | Application Group        | Application Info               | Type | Network Response | Application Response |
|---------------------|--------------------------|--------------------------------|------|------------------|----------------------|
| Apple               | Web Content Services     | uuid=a41d4b28 ServerIP=2...    |      | 13ms             | 14.4ms               |
| Twitter             | Social Networking        | IssuerIdAtCommonName=V...      |      |                  |                      |
| iCloud              | Cloud Storage            | uuid=0ca5d015 ServerIP=1...    |      | 35.2ms           | 34.2ms               |
| Weather Channel     | News and Information     | URI="/wxdata/mobile/moba...    |      | 9.94ms           | 20.8ms               |
| Apple iMessage      | Real Time and Cloud C... | URI=/connectivity.txt Conte... |      | 13.5ms           | 14.6ms               |
| Amazon Web Services | Cloud Computing          | URI=/49047a3476a311e39...      |      | 22ms             | 36.6ms               |
| Apple               | Web Content Services     | uuid=bf97abce ServerIP=23...   |      | 13.5ms           | 14.1ms               |
| Facebook            | Social Networking        | SwitchType=CoreFlow Serv...    |      | 124ms            | 124ms                |



# Top Applications by Flows and Bandwidth

Dashboard Application Flows Fingerprints

Appliance: NOC Sensor Applications Browser Dashboard

Start: 01/15/2014 11:00 AM

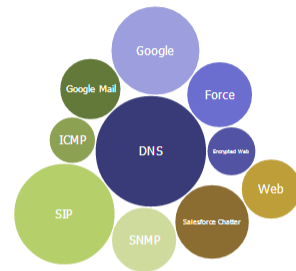
Top Applications by Bytes

Applications -> Total: 67.42 GB

Top Applications by Flows

Applications -> Total: 1618055 flows

提供從不同面向（頻寬使用、  
Flow、使用者群組、位置）  
了解網路應用情形

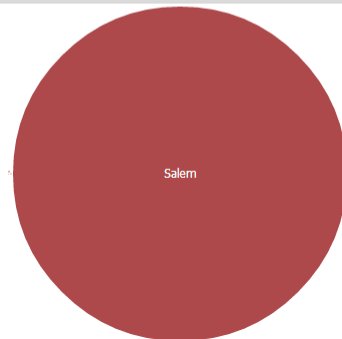
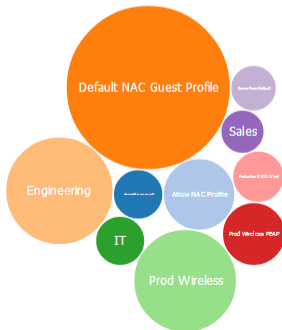


Top Profiles by Bytes

Profiles -> Total: 109.21 GB

Top Locations by Bytes

Locations -> Total: 119.36 GB



## 了解IoT Group和Cloud Computing應用的使用狀況

Dashboard **Browser** Application Flows Fingerprints

Salem Purview ▾

Basic **Advanced**

**Options**

Data Table: End-System Details - Hourly ▾

Display Format:  Grid ▾

**Target**

Applications ▾

**Statistic**

Bytes ▾

Aggregation: ☒ Sum ☐ Average

**Start Time**

Last 24 Hours ▾

**Search Criteria**

Location: All ▾

Profile: All ▾

Application Group: Cloud Computing ▾

Device Family: All ▾

User Name:

Application:

Client:

Limit: 15 ▴ ▾

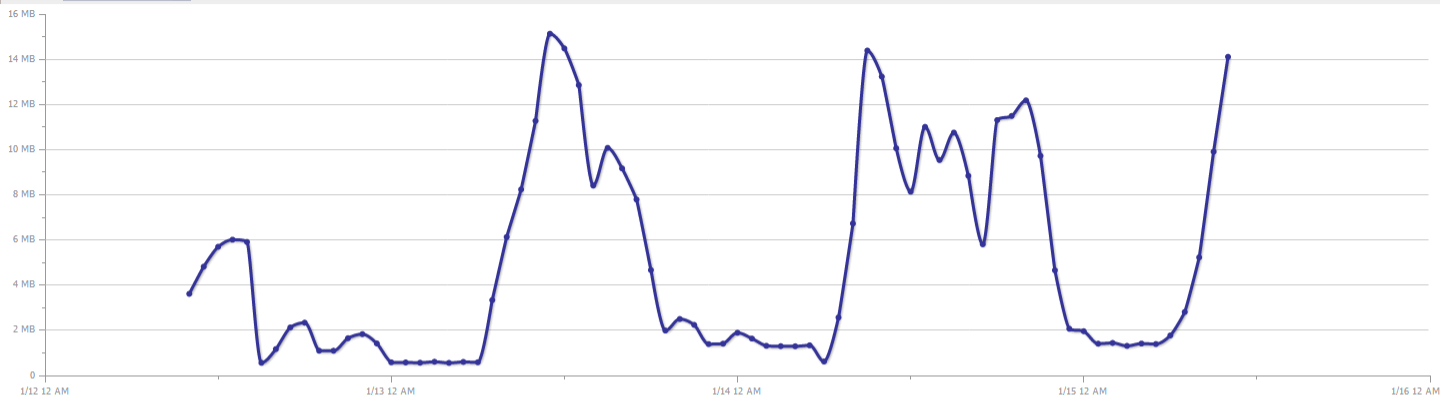
**Applications (Bytes) - Average: 366.30 MB - Last 24 hours - hourly**

| Applications                                                                                          | Application Group | Bytes     | Sent Bytes | Received Bytes |
|-------------------------------------------------------------------------------------------------------|-------------------|-----------|------------|----------------|
|  Amazon Web Services | Cloud Computing   | 1.74 GB   | 72.60 MB   | 1.67 GB        |
|  Force               | Cloud Computing   | 1.29 GB   | 580.86 MB  | 705.15 MB      |
|  Microsoft Office365 | Cloud Computing   | 218.58 MB | 21.05 MB   | 197.52 MB      |
|  Smartsheet          | Cloud Computing   | 131.08 MB | 16.12 MB   | 114.96 MB      |
|  Okta                | Cloud Computing   | 118.67 MB | 28.33 MB   | 90.34 MB       |
|  ATT Cloud Solutions | Cloud Computing   | 109.21 MB | 98.53 MB   | 10.68 MB       |
|  Windows Azure       | Cloud Computing   | 56.43 MB  | 1.14 MB    | 55.30 MB       |
|  Wunderlist          | Cloud Computing   | 3.48 MB   | 177.28 kB  | 3.30 MB        |
|  New Relic           | Cloud Computing   | 120.37 kB | 50.24 kB   | 70.13 kB       |
|  Boomi               | Cloud Computing   | 12.34 kB  | 3.58 kB    | 8.75 kB        |

# Average Bandwidth Usage for User Profiles

Dashboard Application Flows Fingerprints

Appliance: NOC Sensor Applications Browser



Options

Chart Over Time Top N: ☐

Bookmark

Statistic

Bytes

Aggregation: ☐ SUM ☒ AVG

Start Time

Last 3 Days

Search Criteria

Location: All

Profile: Default NAC Guest Pro

Application Group: All

Device Family: All

Username:

Application:

Client:

Display Options

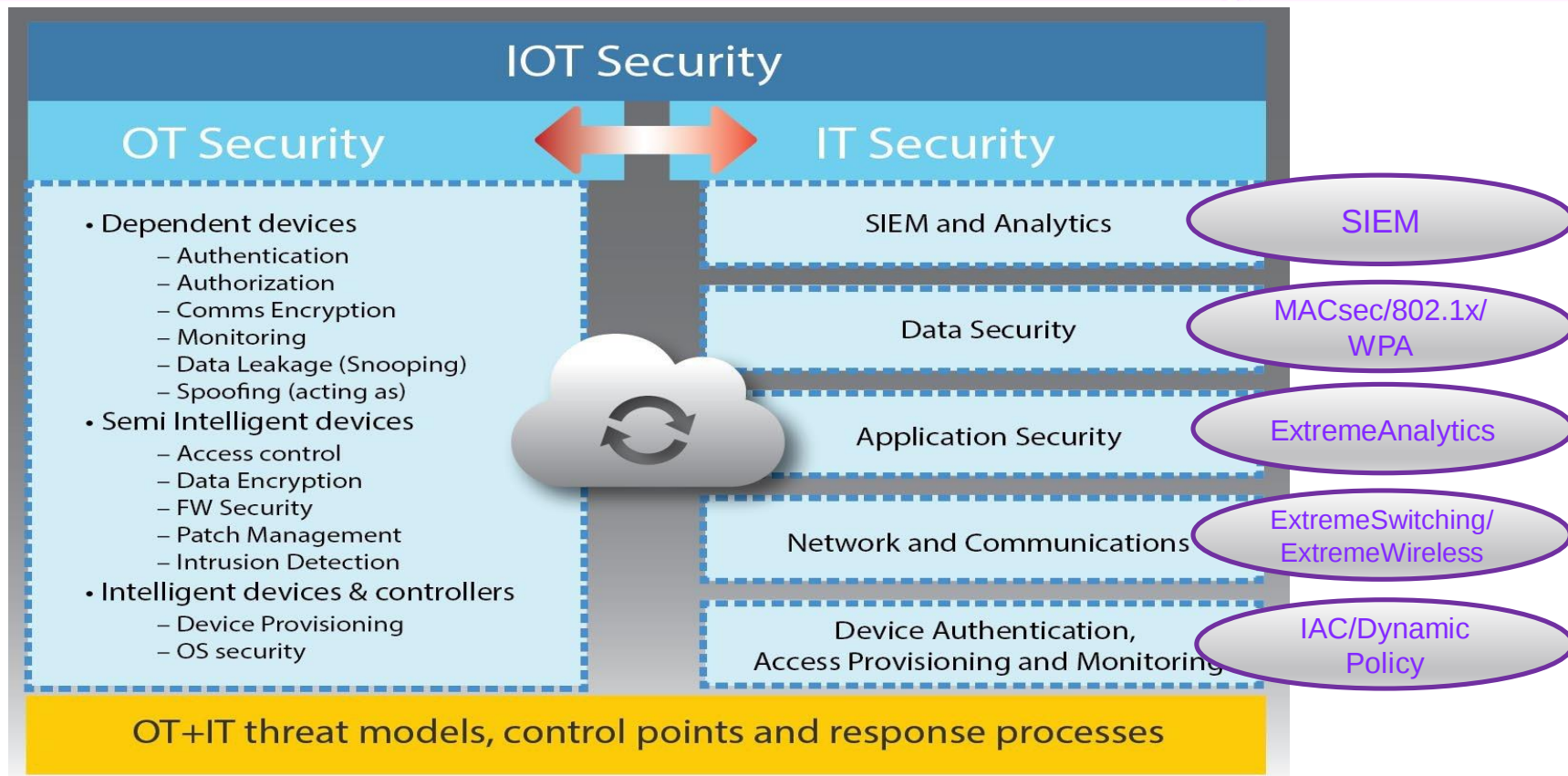
Render As

可觀察學生使用EOR的趨勢或是內部重要應用程式ROI的呈現與差異追蹤

- 資安事件預防
  - 弱點掃描 ( 主動掃描內網設備的漏洞及提供修復方式 )
  - 風險管理 ( 主動察覺網路和系統設定上的漏洞與風險及模擬攻擊行為 )
  - 威脅情資 ( 從雲端資料庫主動更新外部威脅情資 )
- 資安事件偵測
  - 資安事件警告 ( 依優先權排序 )
  - 不同平台事件記錄與分析 ( IoT Server、防火牆、IPS、Router、Switch、Server... )
  - 網路封包資料分析 ( Flow )
- 資安事件稽核
  - 資安事件查詢、追蹤、舉證
- 資安聯防
  - NetSight ( NAC )、Switch、Firewall、IPS

- 降低維運負載
- 即時有效的集中政策控管
- 應用分析
- 資安事件監控管理
- 實體安全

# Extreme Total Solution對應IT Security



- IoT趨勢
- 校園IoT應用
- IoT面臨的安全性威脅
- 導入IoT的注意事項
- Extreme對應的解決方案
- 結論

- 打造智慧化、資訊化的物聯網校園是未來的趨勢，透過這樣的應用可以提供師生更好的教學環境，更便利的學習方式及更有效率的政策執行。  
**Gartner**的副總裁分析師**Jim Tully**博士表示，「物聯網的價值是由服務來驅動」。所以當它帶給我們更便利、更智慧的生活的同時，單位必須確保該價值不會因為不安全的產品，不適合的網路架構，不當的使用給破壞。讓我們做好準備迎接這波物聯網世代的來臨。



Better Connections. Better Experiences.  
For Everyone.



[WWW.EXTREMENETWORKS.COM](http://WWW.EXTREMENETWORKS.COM)