# SDSN for IoT

## Stopping threats to the new IoT network

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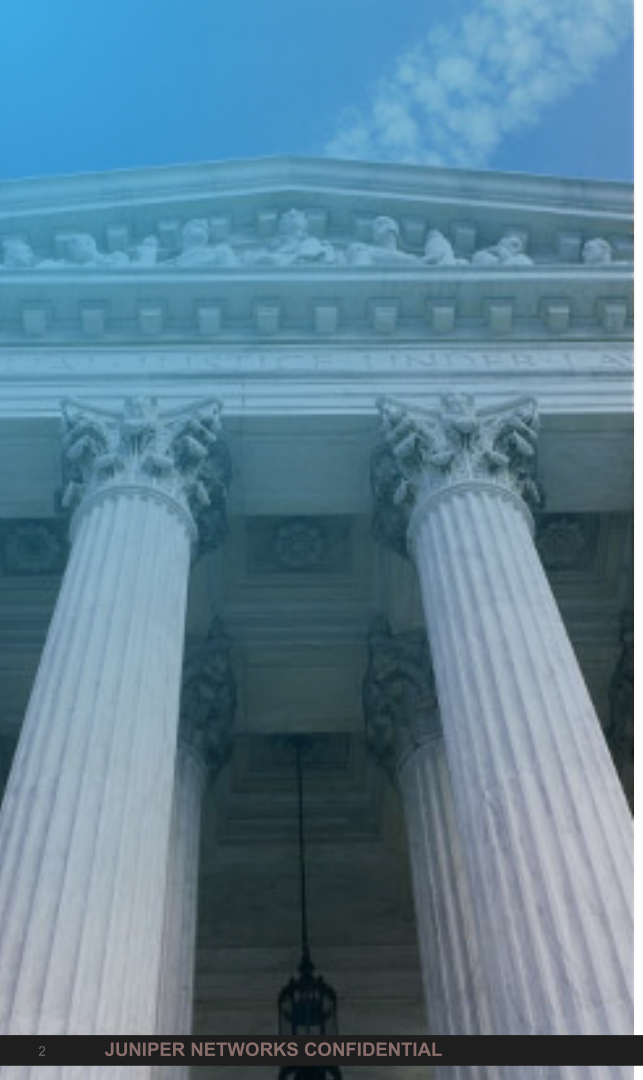

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**This presentation is subject to NDA stipulations**


IoT Ransomware

# IoT – The Art of Optimization

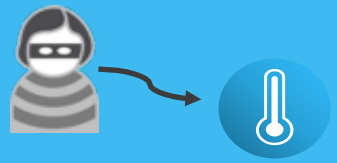

Optimal outcomes

# IoT – Security Threats


Destruction & Chaos

# IoT ransomware – a flow chart…

Malware infiltration



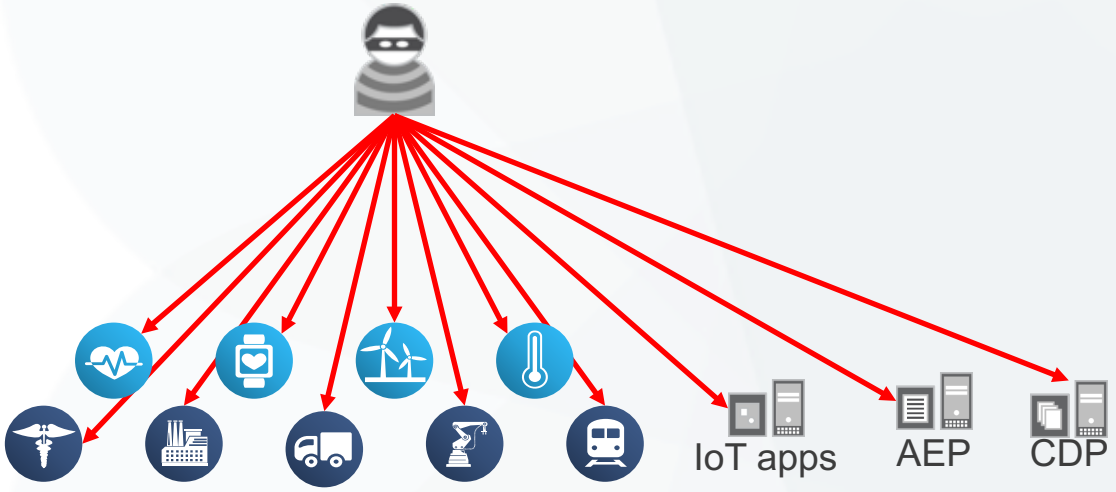
Threatens destruction

# Getting ransomware and malware into IoT networks

DNS spoofing

Default passwords

Phishing attacks




Both IoT devices **and** IoT application servers / supporting servers

# Real world examples of IoT malware / ransomware

## Example 1:

**Thermostat ransonware**

http://motherboard.vice.com/read/internet-of-things-ransomware-smart-thermostat


## Example 2:

**Amazon cameras malware**

http://www.securityweek.com/malware-found-iot-cameras-sold-amazon

## Example 3:

**Jeep remote control**

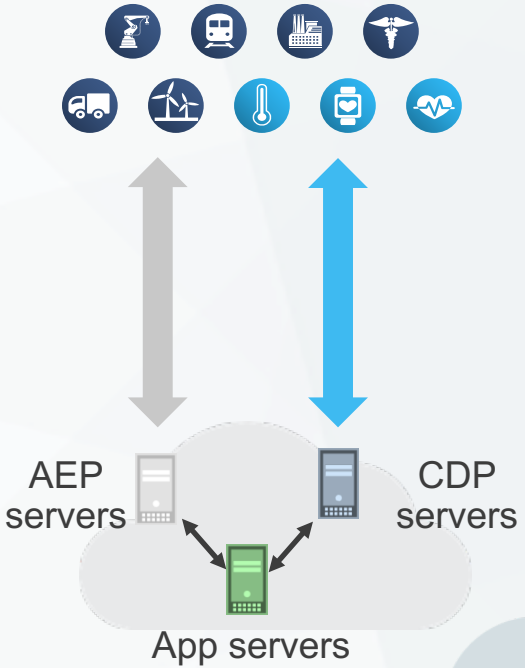
https://www.wired.com/2015/07/hackers-remotely-kill-jeep-highway/

# Targets for IoT Ransomware and Malware

IoT devices

## Server side IoT

- IoT application servers
- Application Enablement Platforms
- Connected Device Platforms

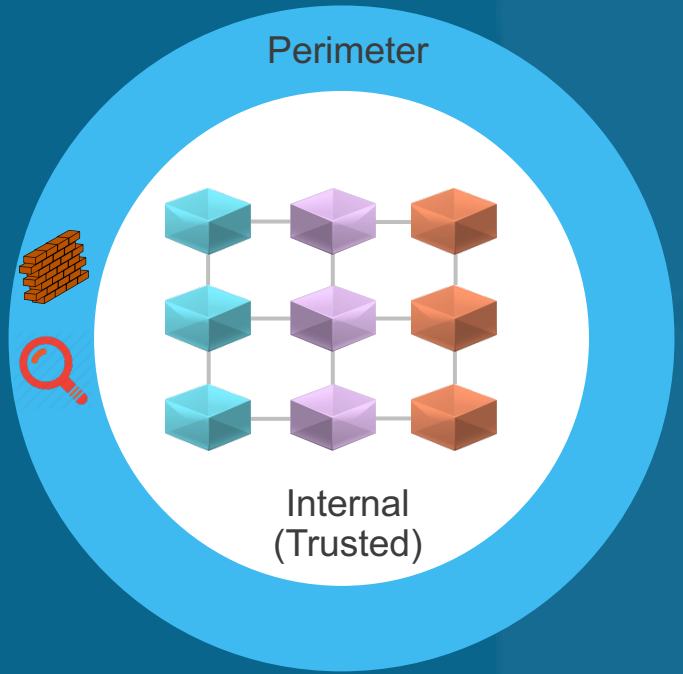


# Potential IoT ransomware

| IoT Ransomware | Impact |
| --- | --- |
| Connected home mayhem | Injury, destruction, death |
| Misdirect connected cars | Injury destruction, death |
| Stop traffic lights | Gridlock, mayhem, injury |
| Medical device remote control | Injury, death |
| Deactivate water quality sensors | Sickness, death |
| Remote control of industrial IoT | Injury, destruction, death |


Software Defined
Secure Networks
(SDSN)

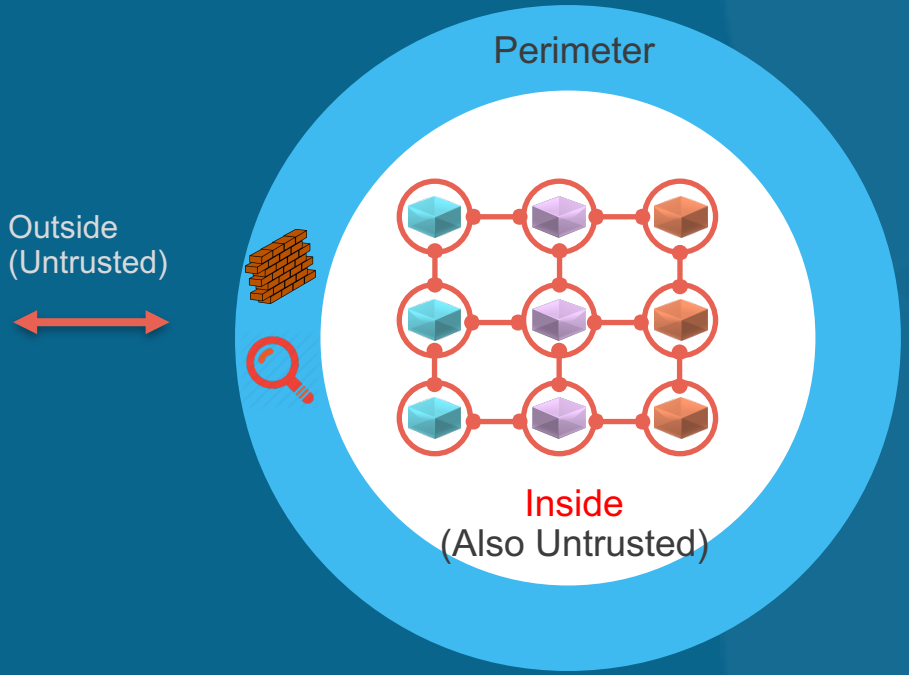
# Perimeter Oriented Security




- Hyper-connected Network Security at Perimeter
- Complex Security Policies
- Lateral Threat Propagation
- Limited Visibility

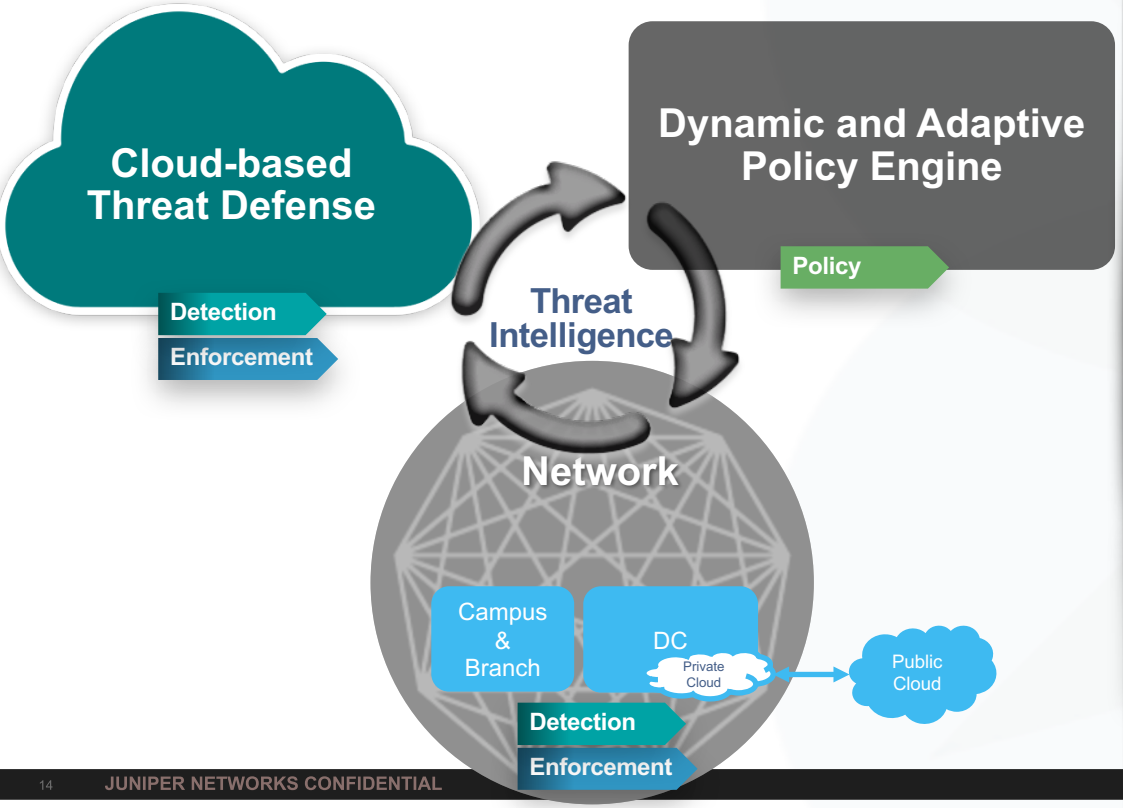
# Software Defined Secure Network

## Delivers Zero Trust Security Model




- Secure Network
- Simplified Security Policy
- Block Lateral Threat Propagation
- Comprehensive Visibility

# Software-Defined Secure Network
## Policy, Detection & Enforcement




## Bottoms Up and Top Down Approach –

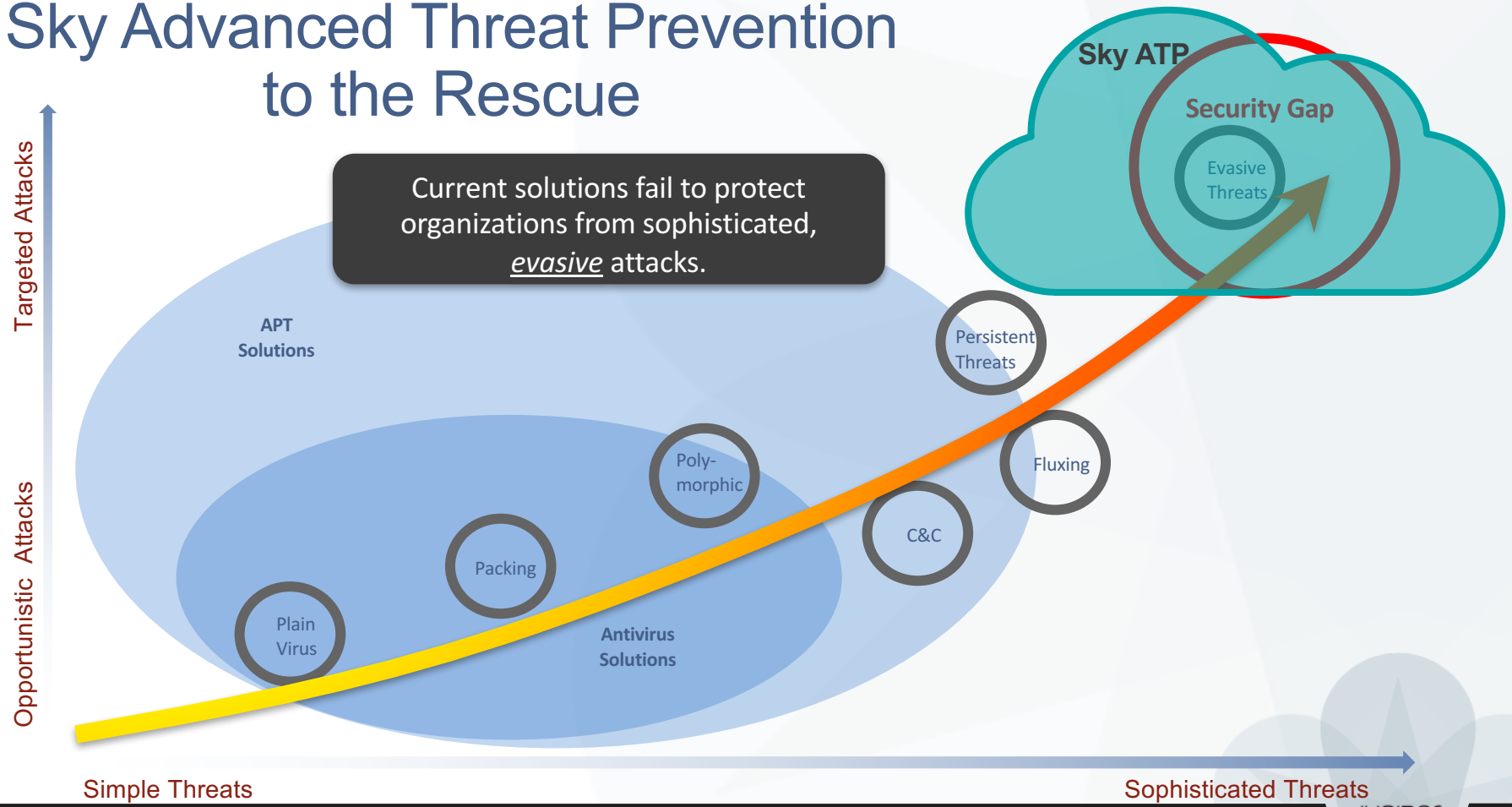
Leverage **entire network and ecosystem** for threat intelligence and detection

Utilize **any point** of the network as a **point of enforcement**

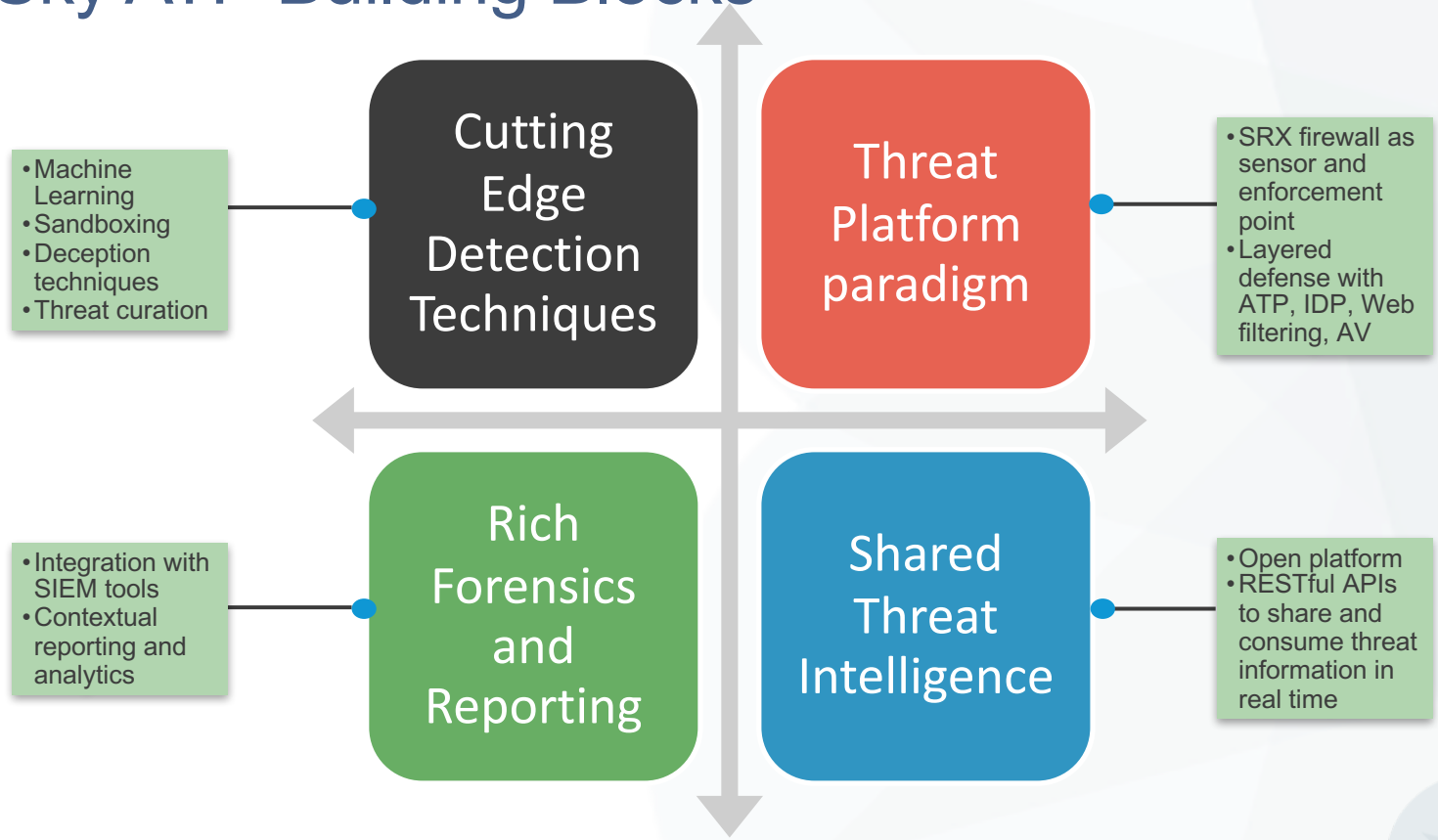
**Dynamically execute policy** across all network elements including third party devices


Detection: Sky ATP

# Sky Advanced Threat Prevention to the Rescue



# Sky ATP Building Blocks



# The ATP Verdict Chain

## Staged Analysis: combining rapid response and deep analysis


Suspect files enter the analysis chain in the cloud

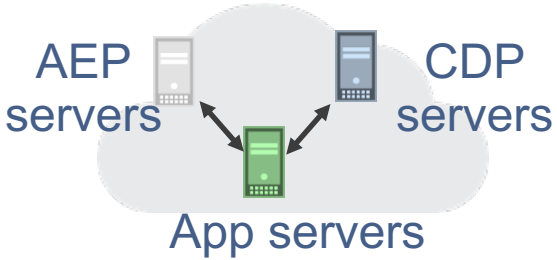
**Cache lookup: (~1 second)**
Files we've seen before are identified and a verdict immediately goes back to SRX

**Anti-virus scanning: (~5 second)**
Multiple AV engines to return a verdict, which is then cached for future reference

**Static analysis 1st stage: (~5 second)**
The static analysis engine does a deeper inspection, with the verdict again cached for future reference

**Dynamic analysis: (~7 minutes)**
Dynamic analysis in a custom sandbox leverages deception and provocation techniques to identify evasive malware. The 2nd stage Static Analysis run in parallel

# IoT specific Advanced Threat Detection




## IoT servers

Based on Windows or Linux

Juniper Policy Enforcer can stop East-West propagation

## IoT devices

Many are Linux based

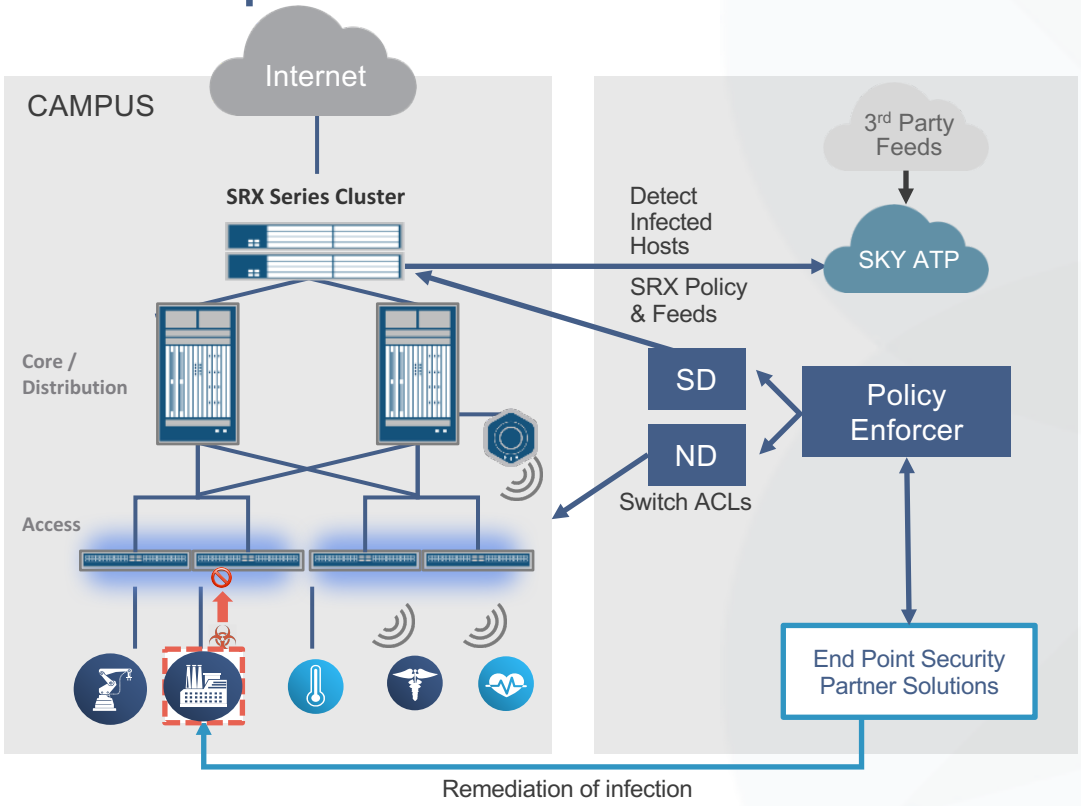
Sky ATP: static & dynamic analysis for IoT malware

Will be tailored for specific devices & applications

**SkyATP supports 3rd party detection integration**


SDSN Solutions to IoT Threats

# Enterprise IoT infection – SDSN solution



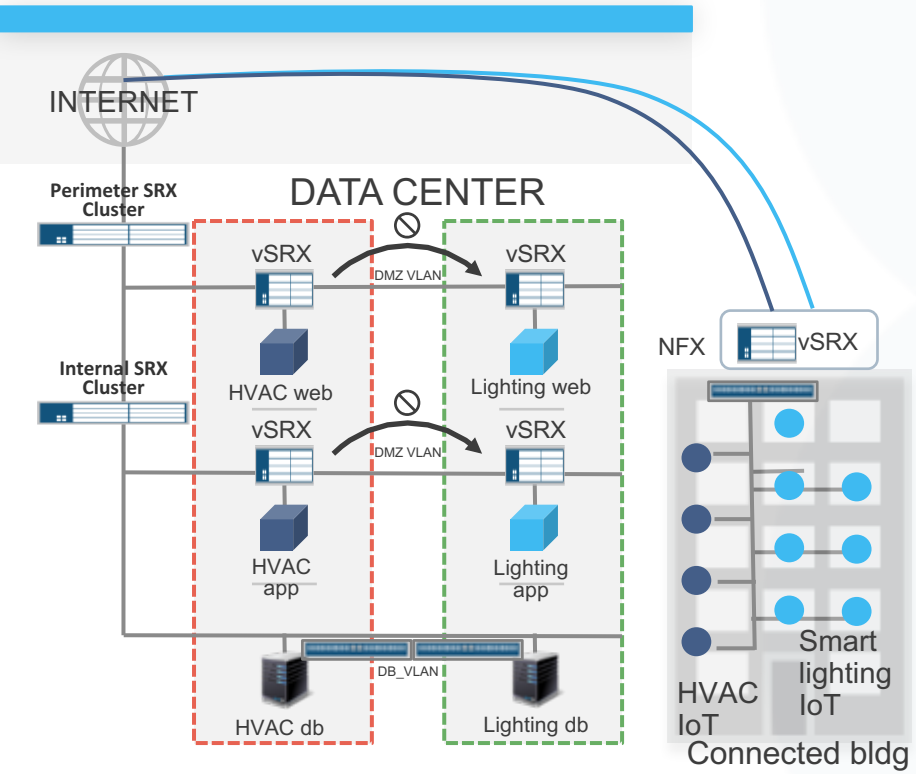

## THREATS

- Lateral threat propagation
- IoT botnet army recruitment

## SOLUTION BEHAVIORS

- SkyATP detection of infected IoT UEs
- C&C feeds
- Policy per IoT device type
- Enforce @ JNPR routers, switches, firewalls using infected host feed
- 3rd party remediation of infection

# Smart city connected buildings – SDSN solutions



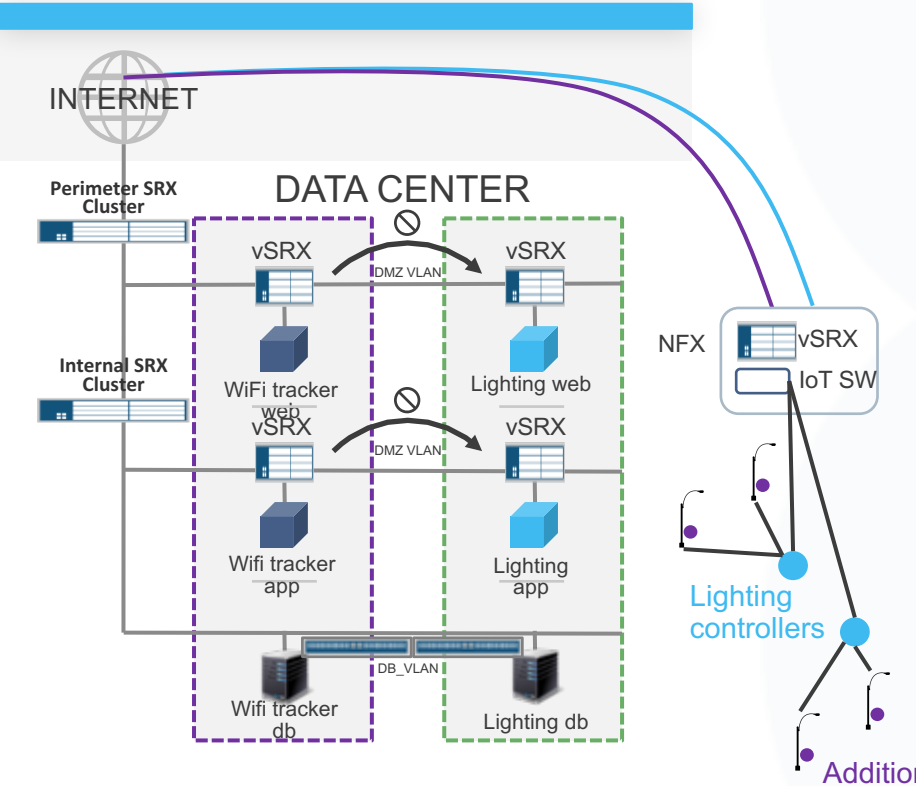

## THREATS

- Malware / ransomware targeted at IoT devices
- IoT device traffic “wandering”
- IoT devices attacking IoT servers

## SOLUTION BEHAVIORS

- SDN w/NFX & Contrail to service chain vSRX
- vSRX / NFX limits lateral threat propagation & quarantines infected servers & IoT devices
- SkyATP detection of infections
  - @ Connected building: infected IoT
  - @ DC: infected app/web/db servers
- vSRX protocol conformance / enforcement
- Traffic policies enforced w/ v/SRX & switches

# Smart city lighting – SDSN solution



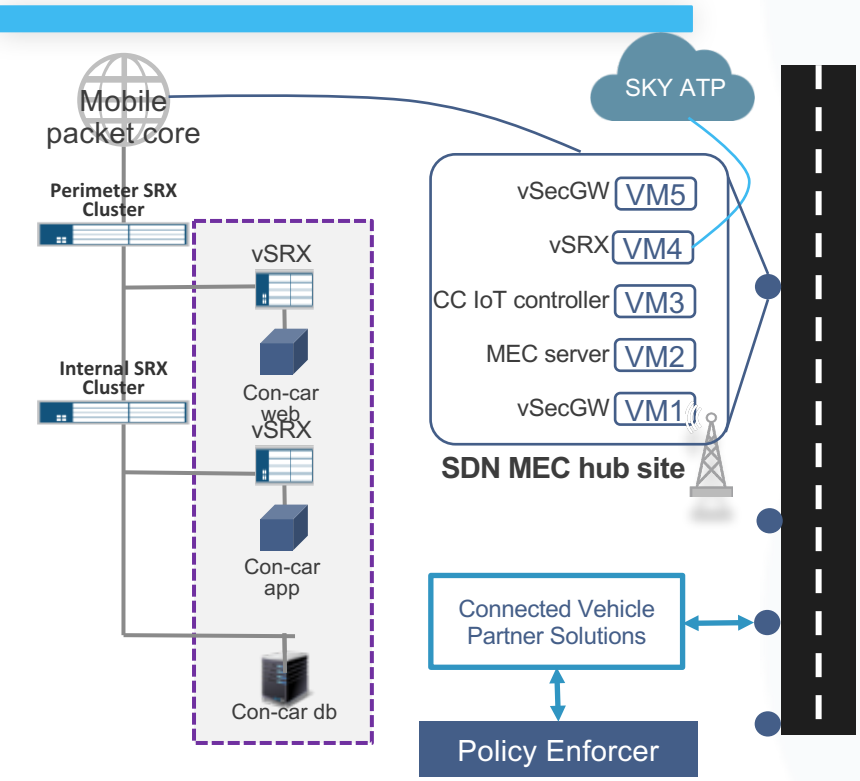

## THREATS

- Malware / ransomware targeted at IoT devices
- IoT device traffic “wandering”
- IoT devices attacking IoT servers

## SOLUTION BEHAVIORS

- SDN w/NSX & Contrail to service chain vSRX
- vSRX / NSX limits lateral threat propagation & quarantines infected servers & IoT devices
- SkyATP detection of infections
  - Lighting controllers & Additional sensors
  - @ DC: infected app/web/db servers
- vSRX protocol conformance / enforcement
- Traffic policies enforced w/ v/SRX & switches

# Connected vehicles – SDSN solution



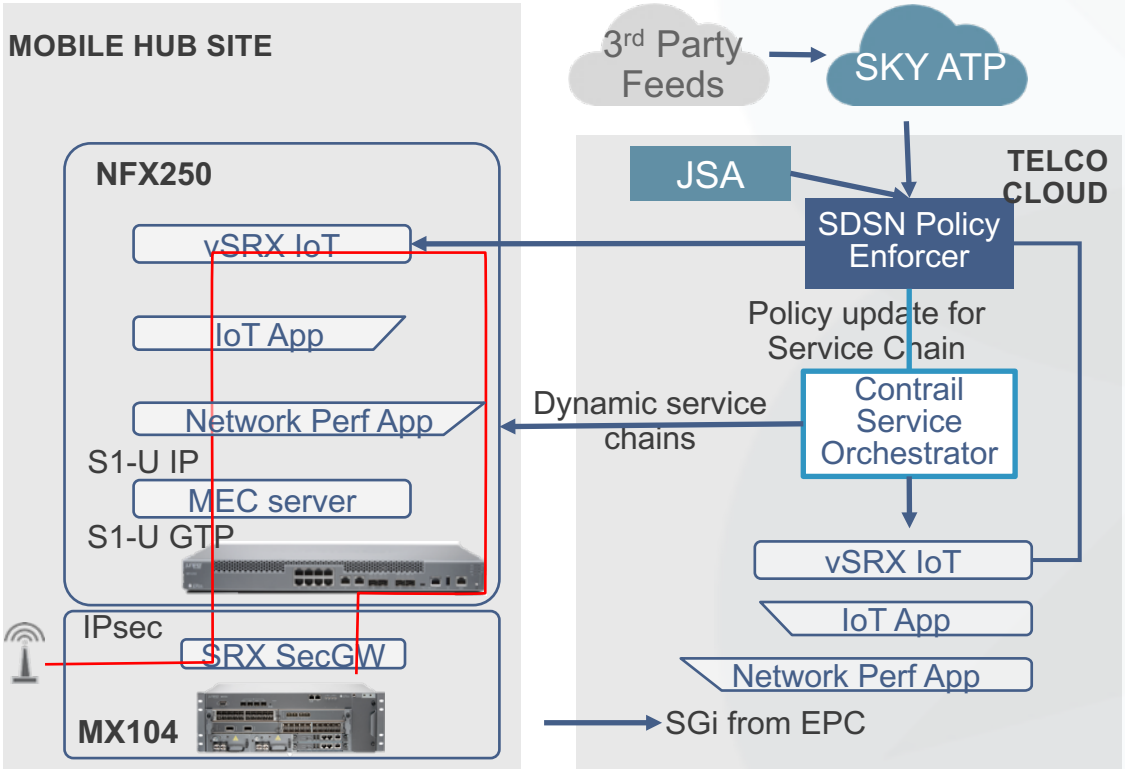

## THREATS

- Disable connected vehicles
- Weaponize connected vehicles
- Vehicle hijacking
- Theft of connected vehicle metadata

## SOLUTION BEHAVIORS

- Enforce network traffic flow policies
- vSRX enforcing protocol conformance
- Sky ATP detects connected vehicle and server side app malware / ransomware
- Quarantine infected vehicles /server side apps
- 3rd party
- MEC for high performance / low latency

# IoT Infected Host Workflow – MEC and mobile




## THREATS

- IoT botnet army recruitment

## SOLUTION BEHAVIORS

- SkyATP detection of infected IoT UEs
- C&C feeds
- Policy per IoT device type
- Enforce @ MEC with vSRX firewalls using infected host feed

# Recap

| SDSN | SDSN FOR IOT | IOT RANSOMWARE & MALWARE | RANSOMWARE & MALWARE |
| --- | --- | --- | --- |
| Detect, policy, enforce | Specific detection for IoT devices | Creating destruction from optimization | Coming to an IoT solution near you |

*BE SAFE: PRACTICE SDSN*

# Thank you