It’s Secure!

Or is it … how do you know for sure?

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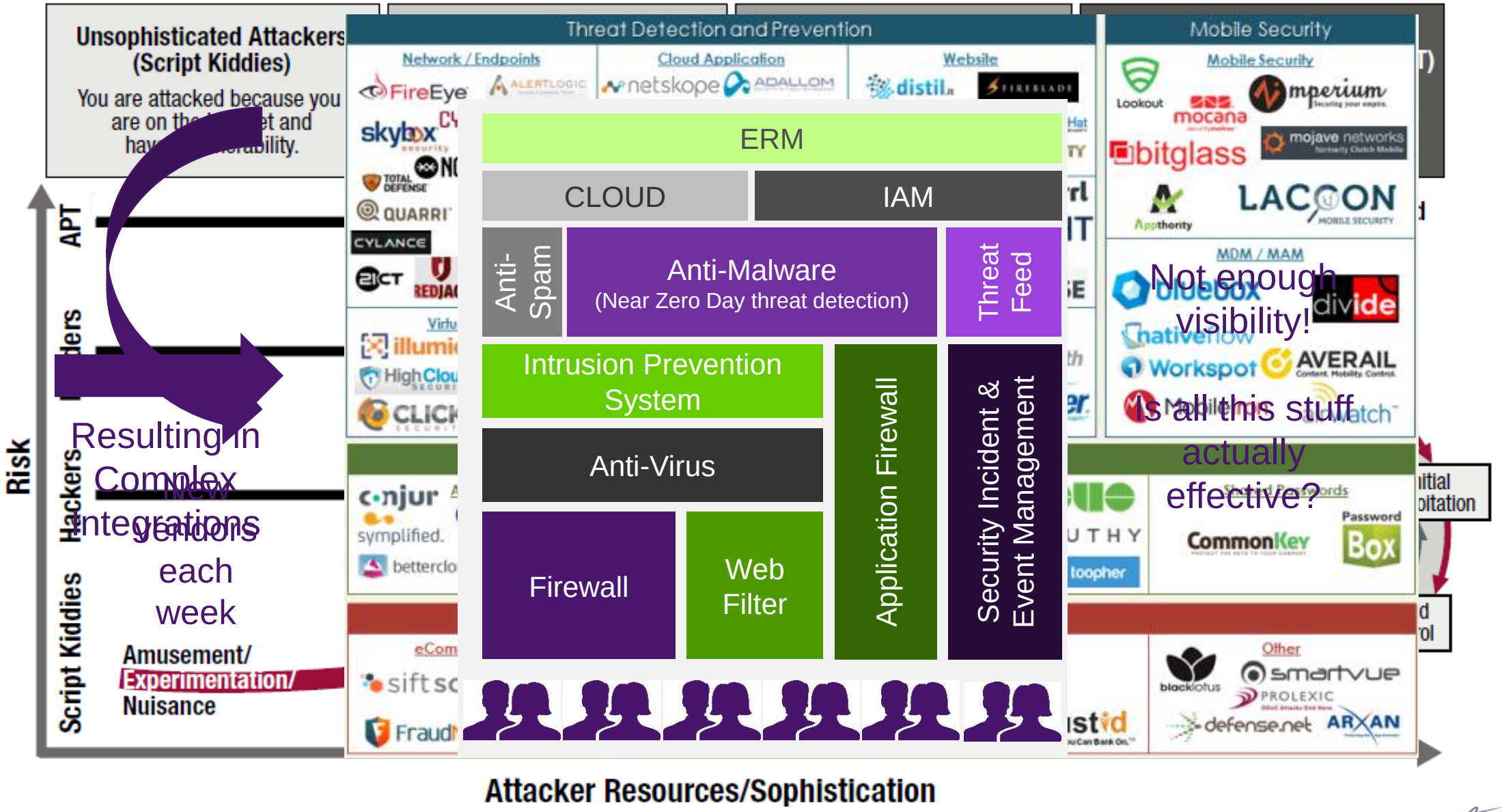
“strong security measures are essential to privacy - from start to finish”

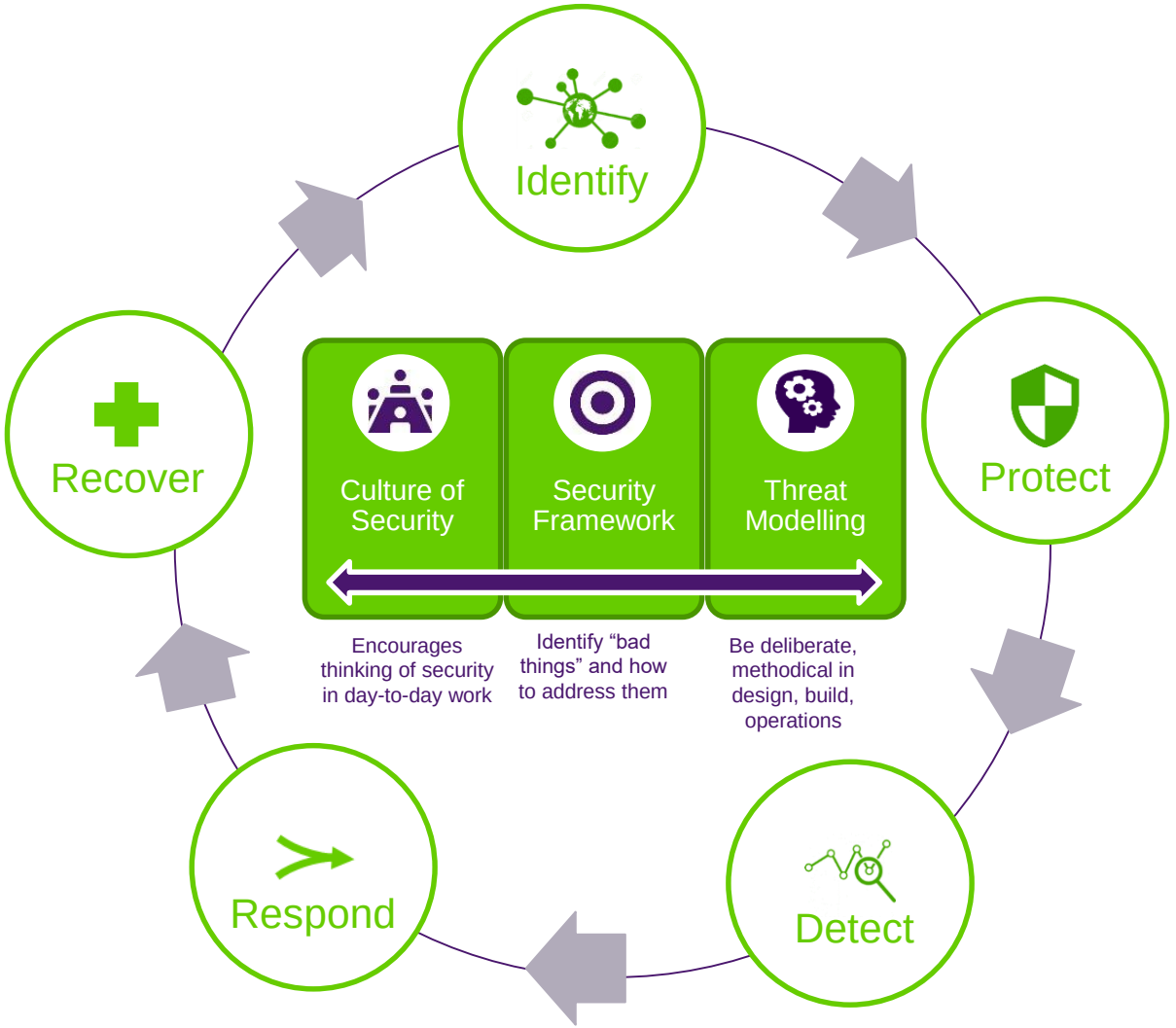
Security | It's Complicated (We've Done it to Ourselves)

The Digital Economy | Security Must Evolve with the Threats



Secure-by-Design | What it Means for TELUS

- Secure by Design (SbD) formalizes the security practice at TELUS
- SbD invests earlier in the project phase and “bakes in” security to the overall project design
- SbD creates fewer (to no) last-minute security overlays
- SbD can support traditional and more modern project management as well as DevOps



- SbD considers the full lifecycle of a system or program, ensuring linkages with Change Management, asset inventories, patching, risk/threat/vulnerability assessments, compliance activities, etc.
- SbD improves tracking and documentation to thereby improves evidence to demonstrate for internal and external audits.

Secure by Design fosters a culture of security

Case Study | Innovative Cyber Security Solutions Powered by Big Data & Analytics

- Hosted in Quebec Intelligence Internet Data Centre
- Capacity
  - 72 Cores
  - 768 GB RAM
  - 144 TB Storage
- ~30TB data/month
- ~2-4 Billion events/hour
- Log Retention
  - 90 days raw logs
  - 180 days of authentication events
  - 7 years for incident data

Use Case Library

- Rogue Device Detection
- Brute Force
- Denial-of-Service Alarm
- Non-Active Employee Activity
- Foreign VPN Access
- Service Account Abuse
- Malware payload detonation
- …..
- Customer Use Cases

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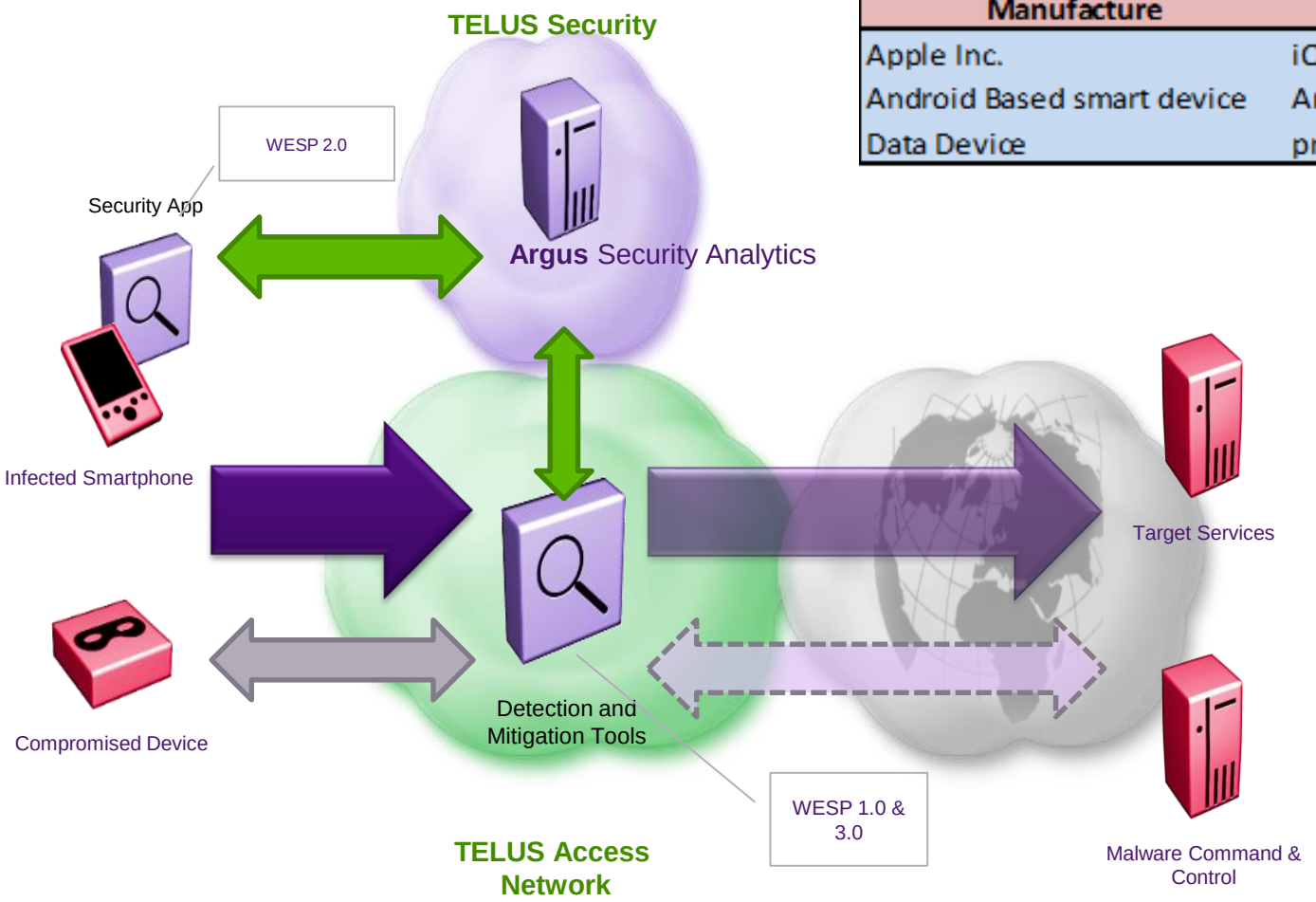


Manufacture	LTE OS	Infected Devices	Device Market Share	Infected Rate
Apple Inc.	iOS	94735	57%	2.82%
Android Based smart device	Android	26223	37%	1.20%
Data Device	proprietary	13811	2%	11.70%

WESP 1.0 Incident Detection

- Detected over 1,110 Sierra Wireless GX450 LTE modems participating in DNS attack and interrupting traffic
- Identified ~20 customers infected with ADUPS malware which sends private information outside the TELUS network
- Monitor the iOS Pegasus malware targeting iPhone users

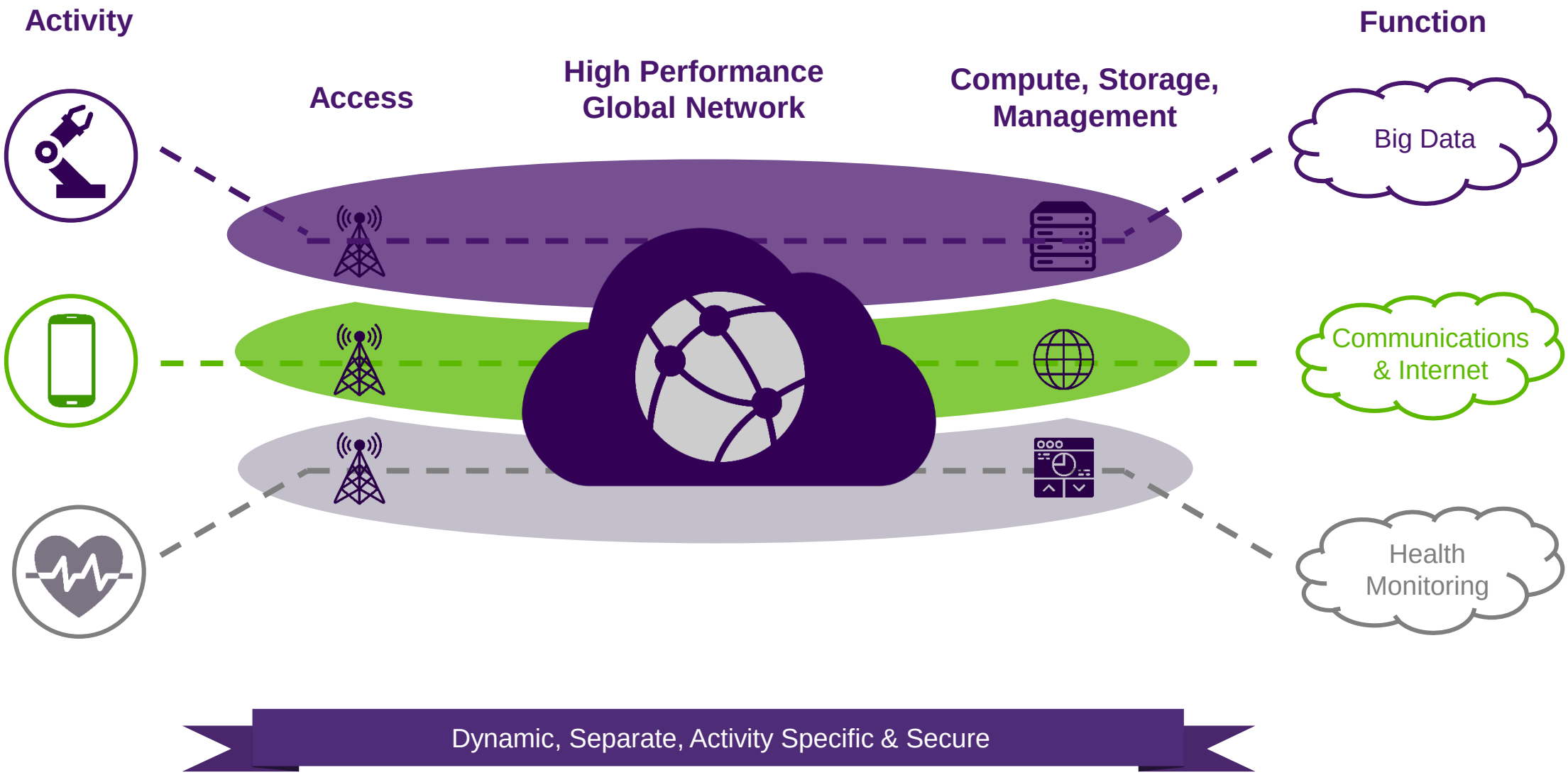
TELUS Wireless Security Checklist

Wireless threats are growing rapidly, particularly in the smartphone and Internet of Things (IOT) space with traffic floods by handsets and mobile malware presenting a growing threat to network reliability

Included for TELUS Customers, the Wireless Edge Security Program (WESP) supports the detection and defence against these threats, minimizing service impact and will support notification and on-device malware removal

	Passive and Active Client Experience	WESP Outcome	NIST Core Framework	Cybersecurity Framework Core				
				Identify	Protect	Detect	Respond	Recover
	Detection of malicious apps using network based tools *(passive)*	Network Based Malware Detection (WESP 1.0)	DE.AE, DE.CM, DE.DP			X		
	Blocks data service for wireless devices with known malicious applications impacting the wireless infrastructure *(passive)*	Emergency Walled Garden (WESP 1.0)	PR.AC, PR.PT, RS.RP, RS.CO, RS.AN, RS.MI, RS.IM, RC.RP, RC.IM, RC.CO		X		X	X
	Mobile threat intelligence supports incident response and fine-tuning of security policies *(passive)*	Mobile Threat Intelligence & Reporting (WESP 1.0)	ID.RA, RS.IM, RC.IM	X			X	X
2017	*Smartphone application which will notify users of detected infections and provide options for removal (active)*	*Voluntary Malware Removal (WESP 2.0)*	PR.AT, PR.PT, DE.AE, DE.CM, RS.RP, RS.CO, RS.AN, RS.MI, RS.IM, RC.RP		X	X	X	X
	Detects and stops traffic floods attacks originating from smartphones minimizing the impact to the customer experience (passive)	*Volumetric DDoS Mitigation from RAN (WESP 3.0)*	ID.RA, ID.RM, PR.PT, DE.AE, DE.CM, DE.DP, RS.RP, RS.CO, RS.AN, RS.MI, RC.RP, RC.IM, RC.CO	X	X	X	X	X
	Prevents wireless devices from accessing known malicious websites and botnets (passive)	*Enhanced BotNet and Malicious Site Identification (WESP 3.0)*	PR.AT, PR.PT, DE.AE, DE.CM, DE.DP, RS.RP, RS.AN, RS.MI, RS.IM		X	X	X	

Case Study | 5G Network Function Virtualization e.g. ‘Network Slicing’



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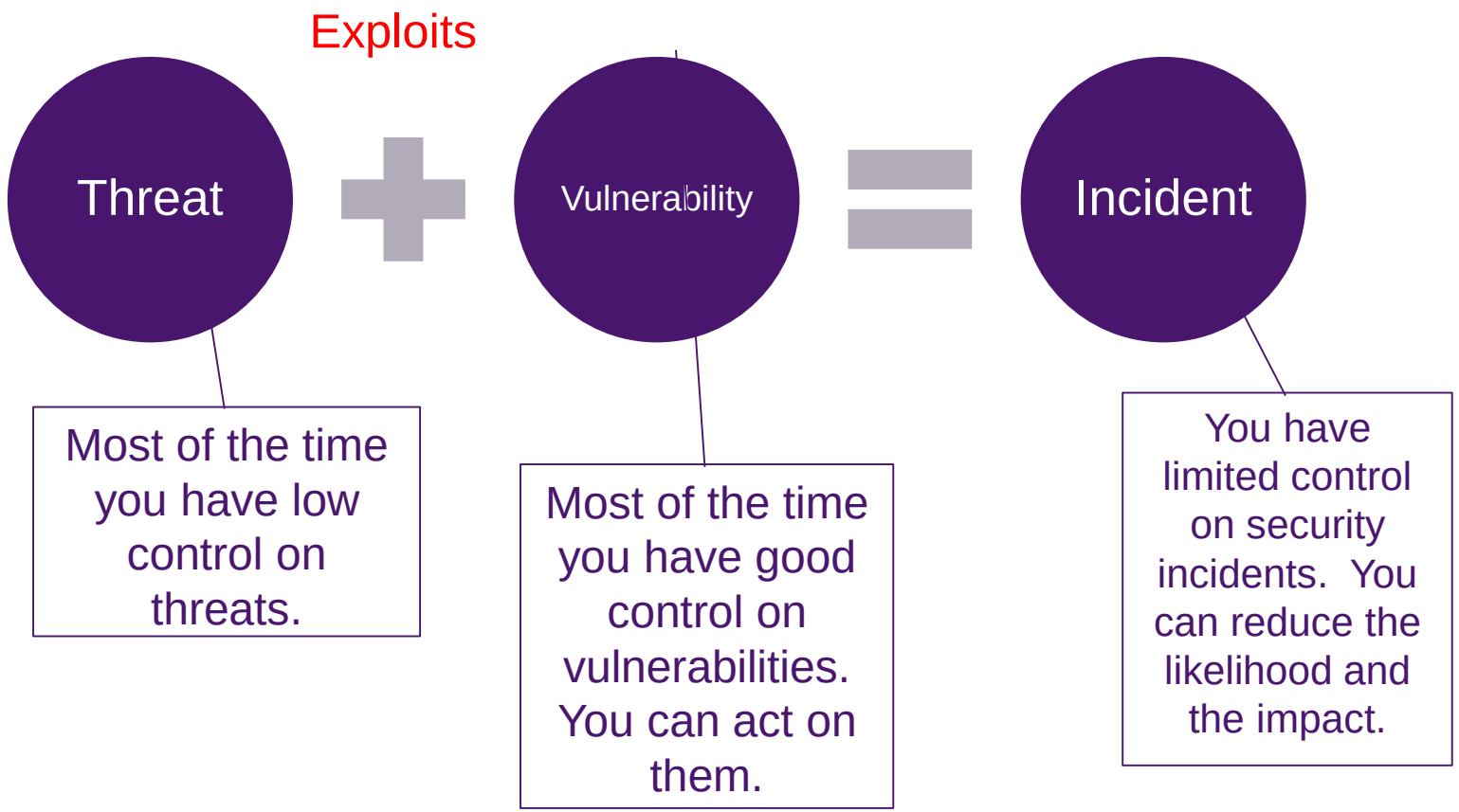
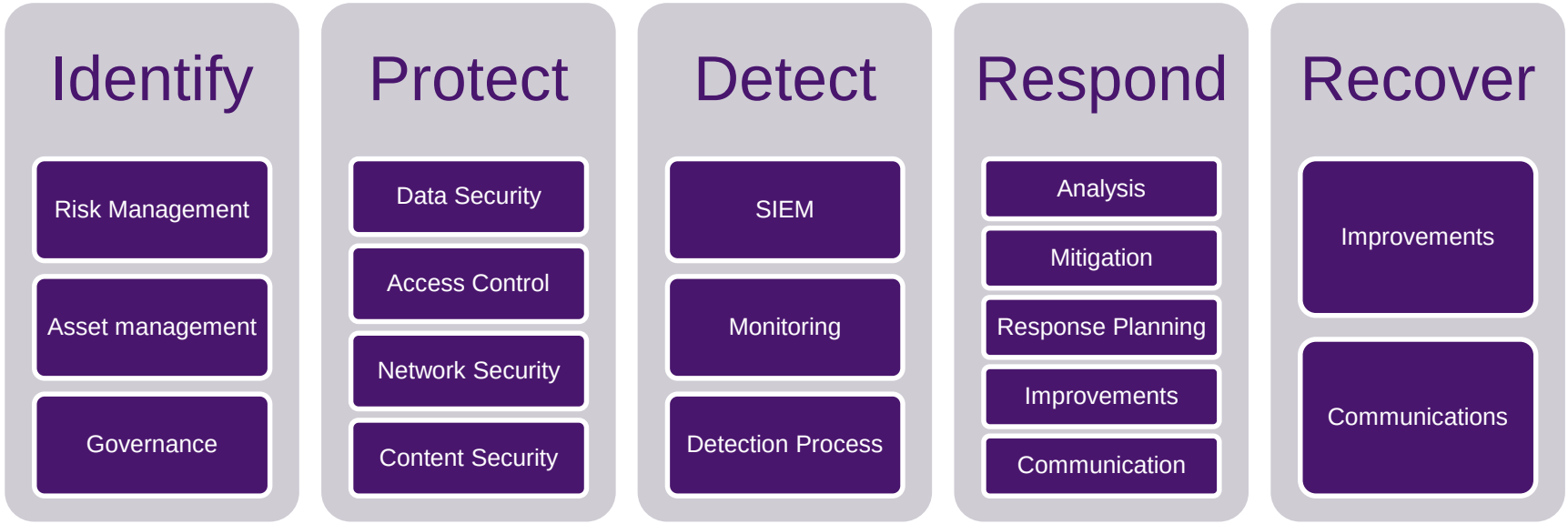
How are TELUS Security Products & Services designed?

To help reduce the impact and likelihood of security incident.



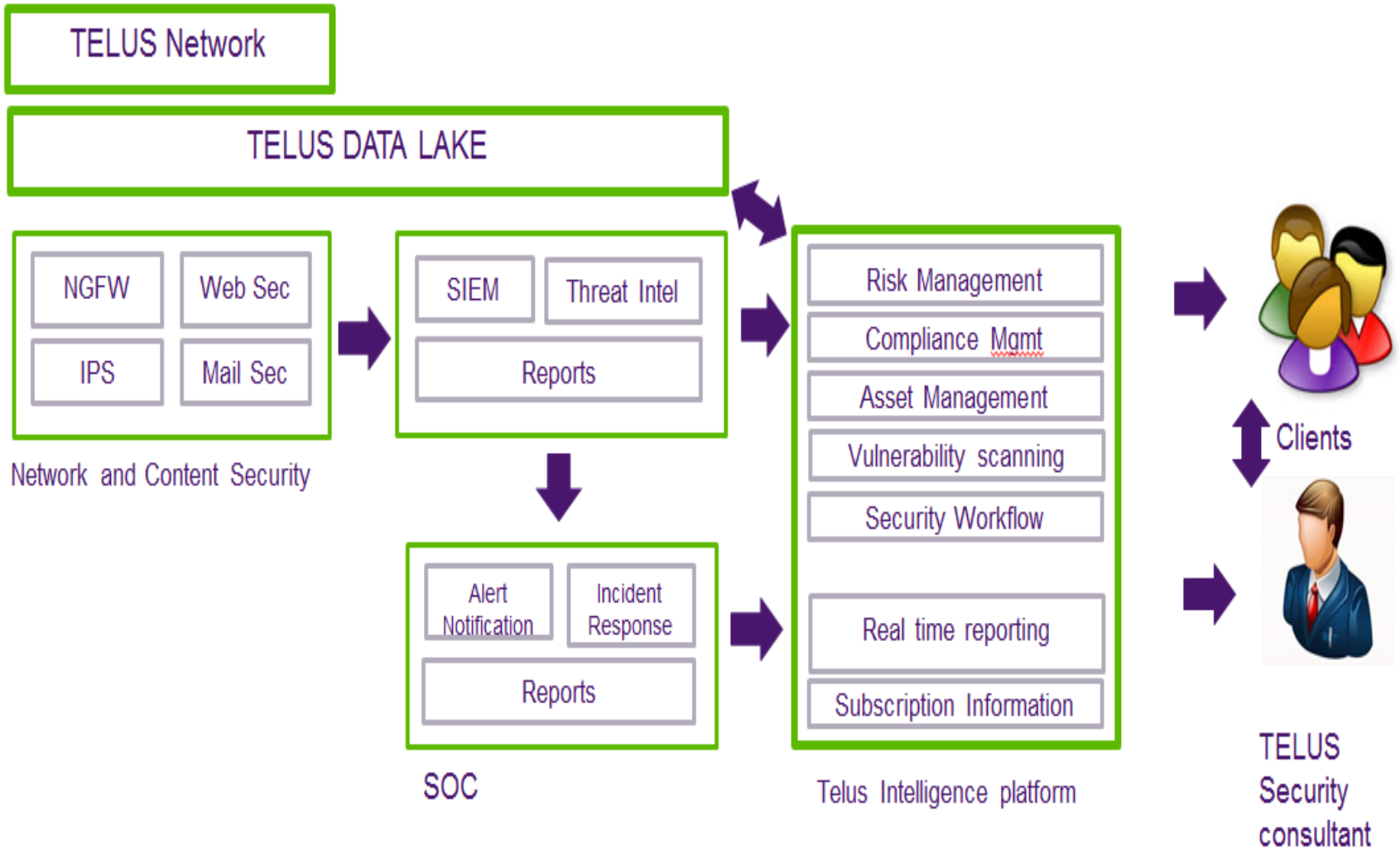
How do you know if they are effective?

TELUS Security products and services leverage the NIST Cyber Security Framework.



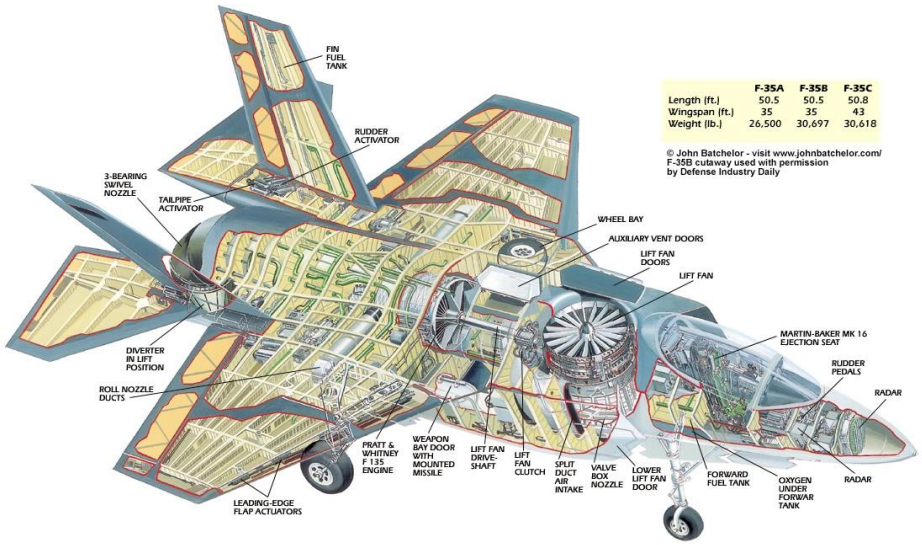
What is the TELUS differentiator?

The TELUS Security ecosystem leverages the *TELUS Network* and the *TELUS Security Intelligence Platform* to integrate all NIST recommended functions in a comprehensive integrated tool box



The Technology the Security Industry Builds

- Leading edge global capabilities
- Targeted at big government & fortune 500 market
- Expensive to operate
- Based on global cyber threat intelligence



What the Canadian Mid-Market can Afford & Needs

- Manageable security solutions
- Properly sized solutions
- Easy to operate
- Based on Canadian cyber threat intelligence

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Products & Services | TELUS Security Bundles

Essentials

Consulting:
GRC Essentials Program

Managed Services:
Next Generation Firewall Essentials
Mail Security Essentials
Web Filtering Essentials
SIEM Essentials

TELUS Security Intelligence Platform

Security Outcome: Visibility

Advanced

Consulting:
GRC Advanced Program

Managed Services:
Next Generation Firewall Advanced
Mail Security Advanced
Web Filtering Advanced
SIEM Advanced

TELUS Security Intelligence Platform

Security Outcomes: Visibility, Compliance

Enterprise

Consulting:
GRC Enterprise Program

Managed Services:
Next Generation Firewall Enterprise
Mail Security Enterprise
Web Filtering Enterprise
SIEM Enterprise

TELUS Security Intelligence Platform

Security Outcomes: Visibility, Compliance, Resilience

Outcomes | How do You know it's Secure?

Secure-by Design for next wave services : SDN/NFV, 5G & IoT

Proven and verifiable
Greater transparency for certification, assessment & audit

Integrated managed security services affordable for the mid-market

Enabling Canadians to securely embrace the digital economy

the future is friendly®