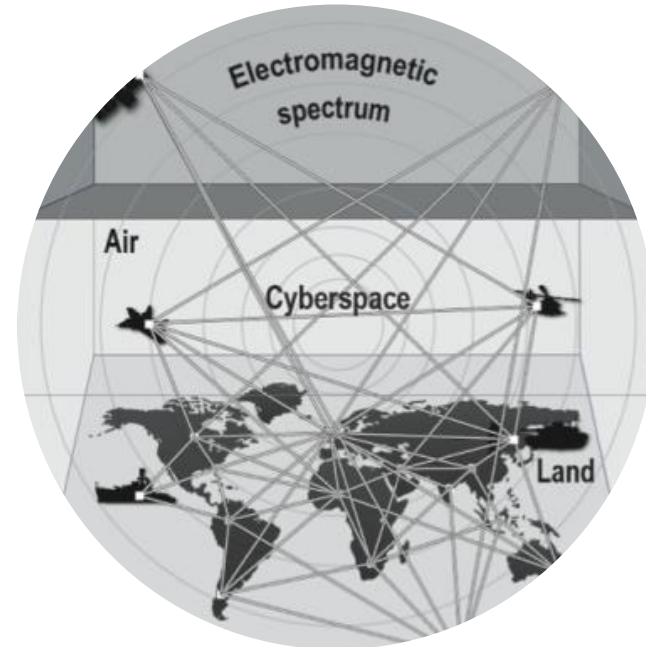
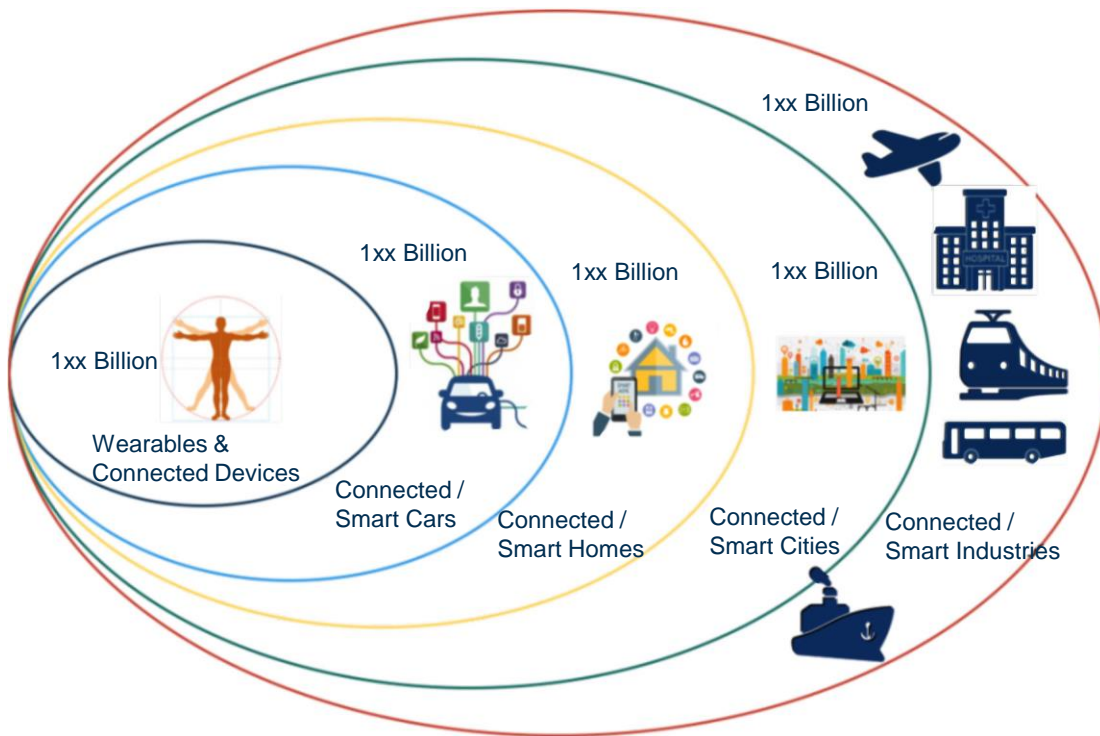
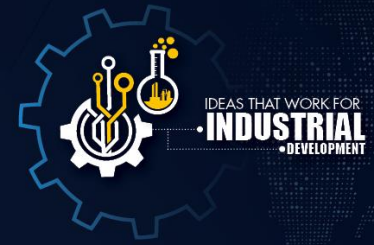


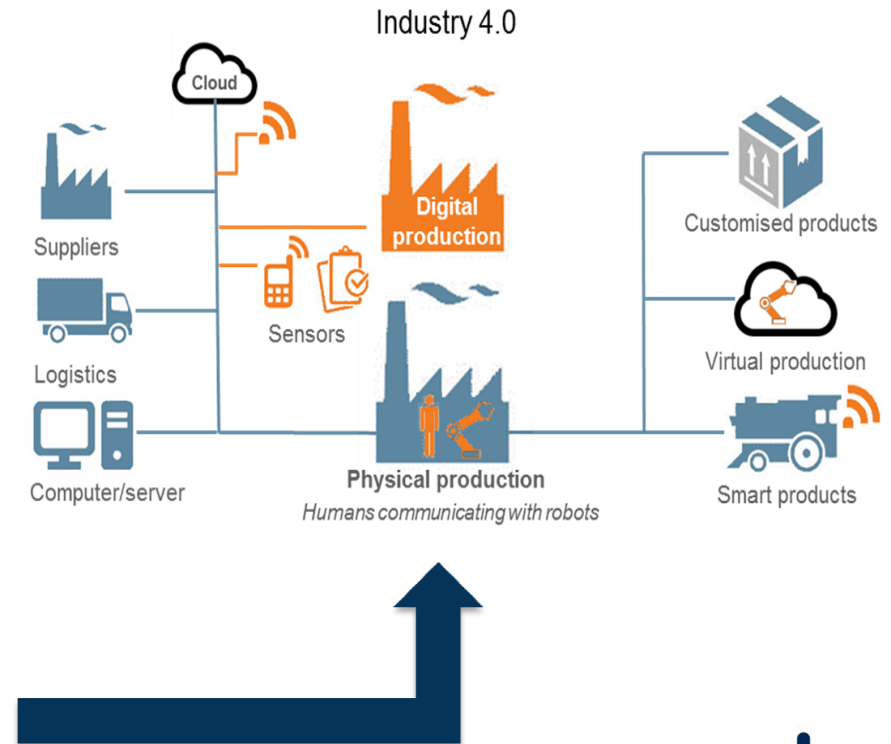
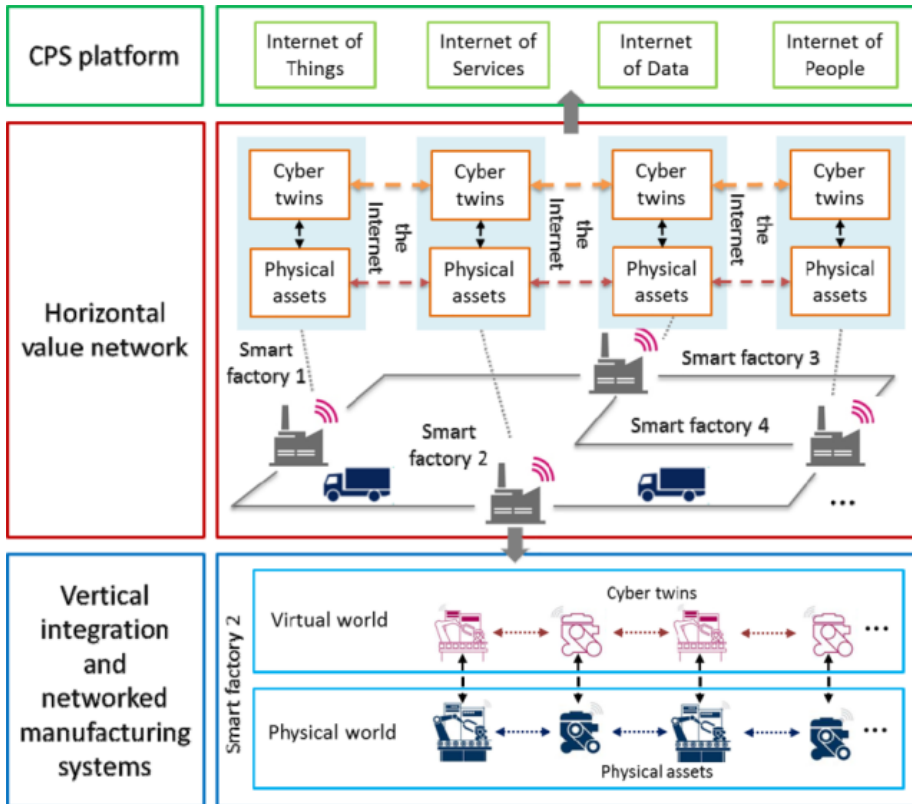
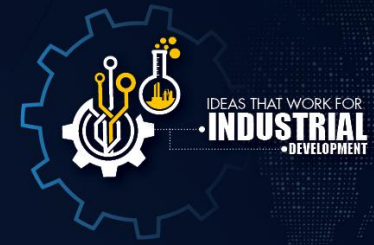
Research and development aimed at enabling Industry 4.0 from a cybersecurity perspective

Dr Jabu Mtsweni
CSIR Research Group Leader: Cyber Defence

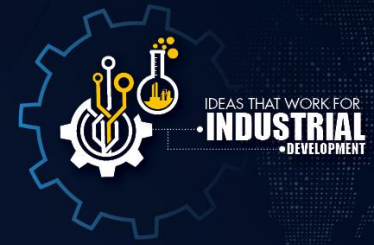
Wired in the wireless world



Industry 4.0 meets Cyber 4.0



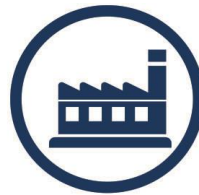
Critical infrastructure sectors



ICTs



Finance



Manufacturing



Food



Health



Energy Utilities



Water



Transportation



Safety

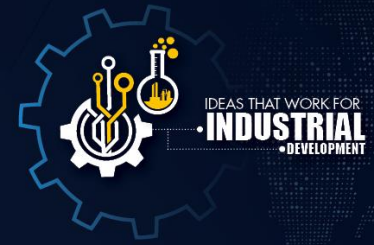


Government

<http://www.iprem.ca/initiatives/InitiativesPics/CriticalInfrastructureSectors.jpg>



Benefits and risks

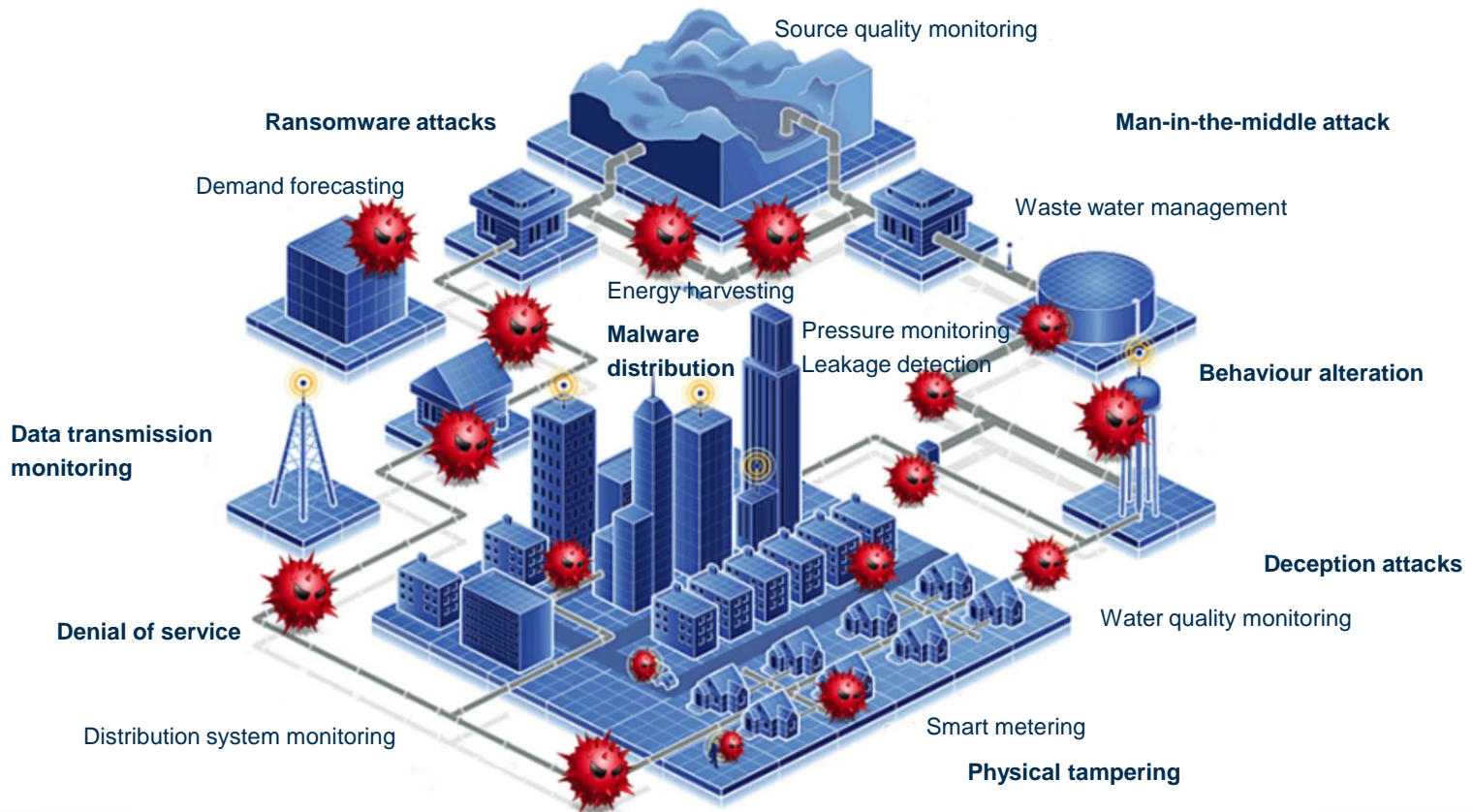
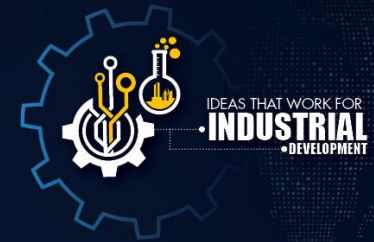


**Doing smart things
(Innovation)**

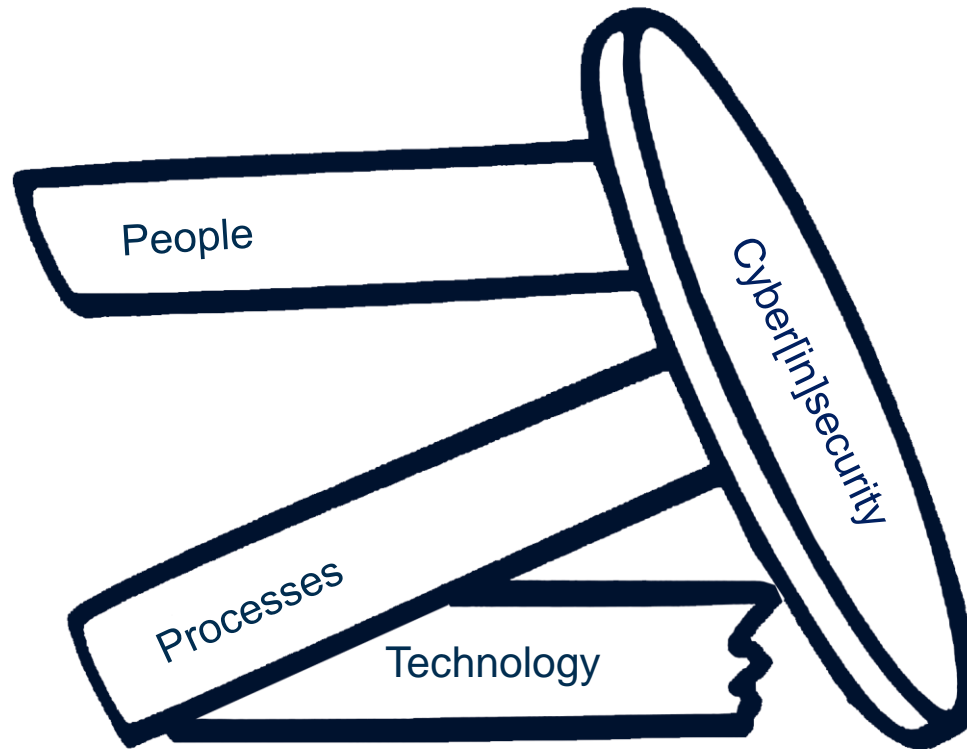
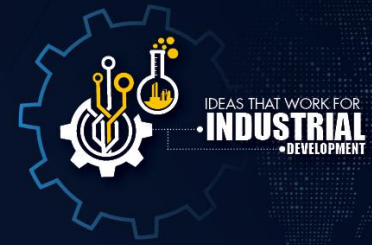
**Doing things smarter
(efficiency and agility)**

**Wider risk surface
(safety and security)**

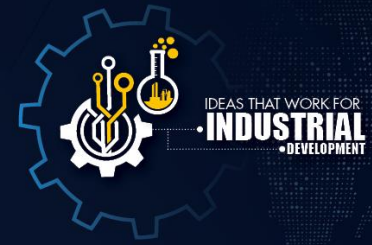
What could go wrong?



Cyber[in]security thinking for Industry 4.0...

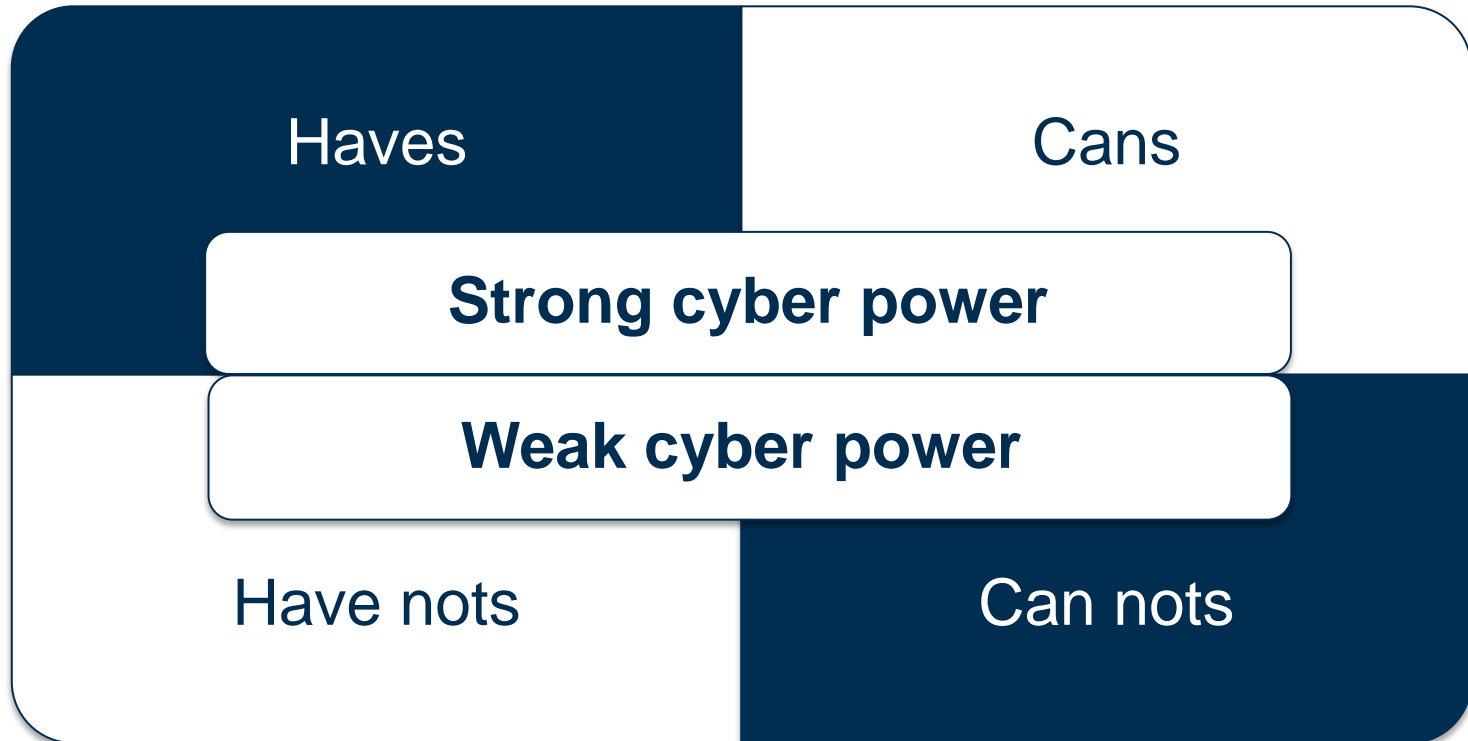
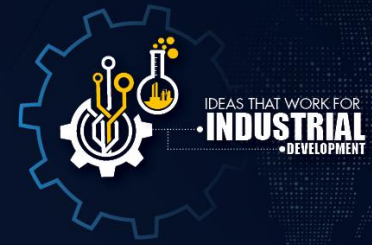


Requirements for a secure and safe Industry 4.0



- Secure-by-design
- Fail securely and safely
- Comprehensive situational awareness
- Rapid data analytics
- Enhanced AI-protection, prevention and detection
- Automated and robotized incident response
- Collaborative threat intelligence sharing
- Human-oriented technologies (safety and security)

Building national capabilities



Capability Development Approach

Capability definition

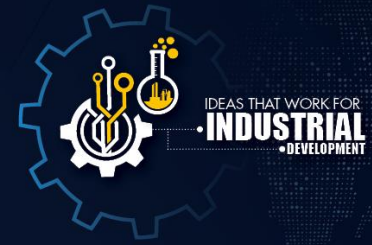
Capability specification

Capability establishment

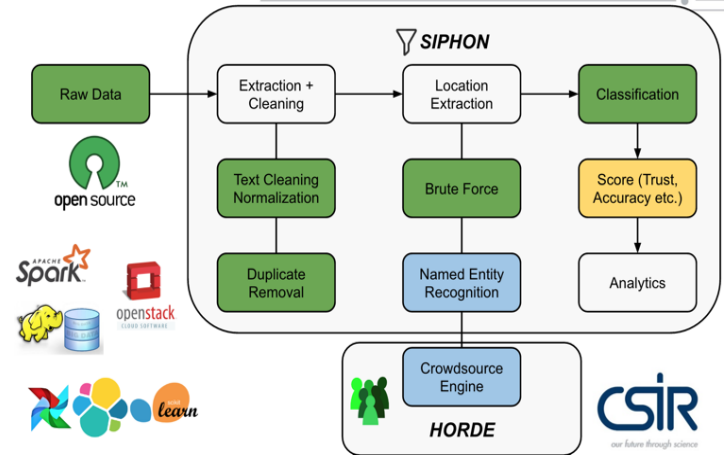
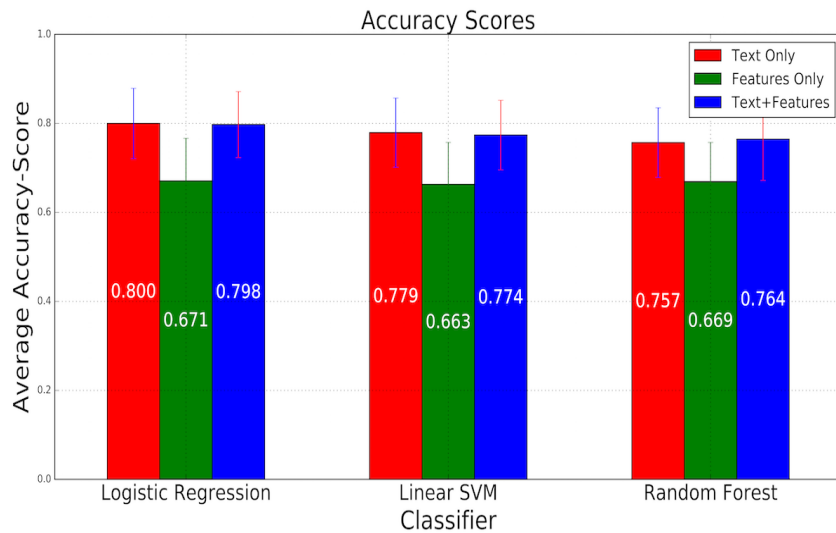
Capability employment



Data science approach to complex problems



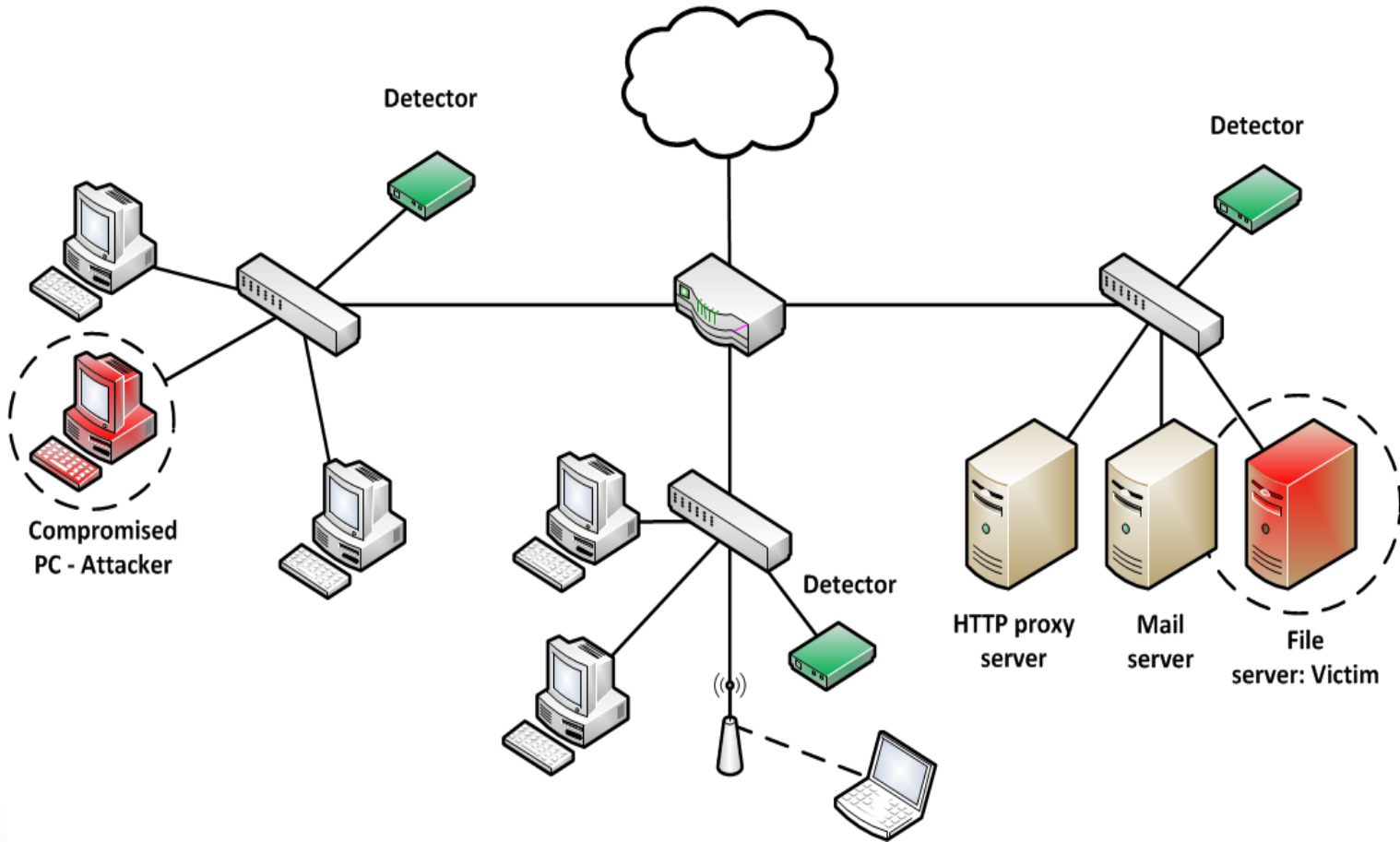
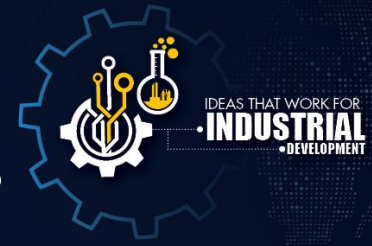
- Predictive modelling (Siphon)
- Integrated view of departments/municipalities (Mati)
- Monitoring and evaluation (Motheo)
- Real-time analytics (Elections)



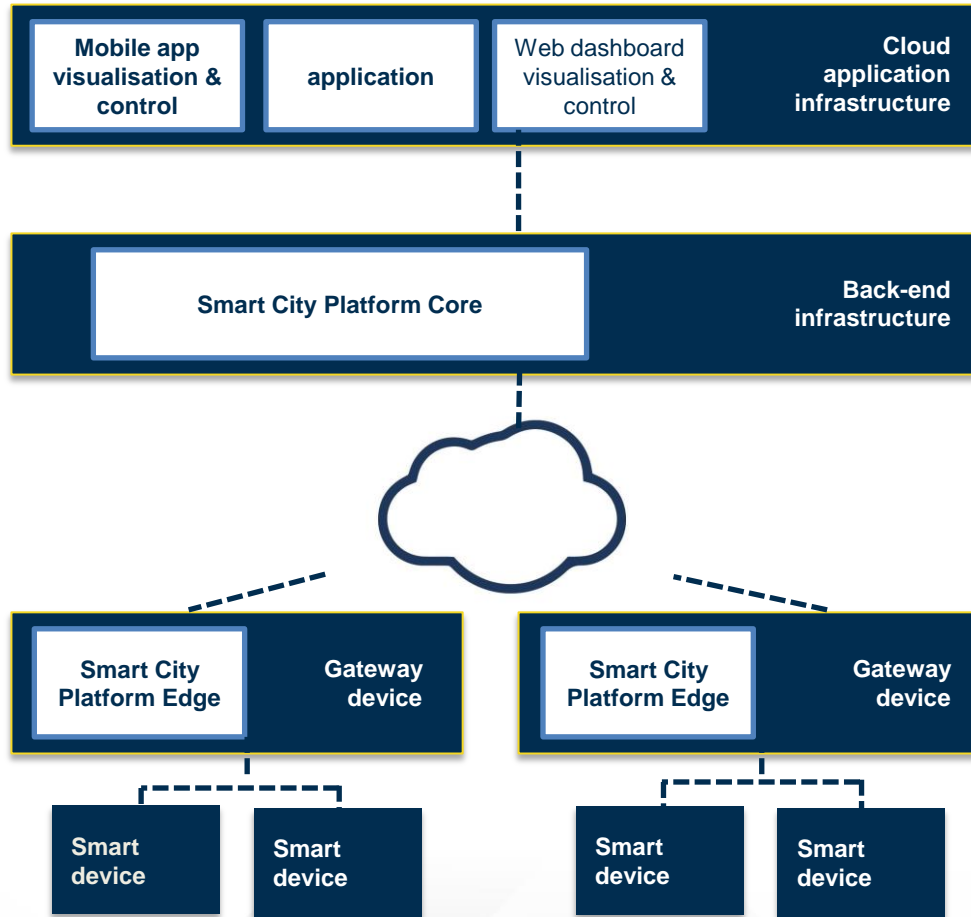
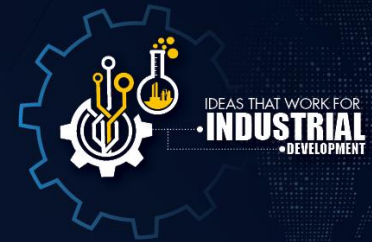
Dr Vukosi Marivate, Ms Pelonomi Moiloa (CSIR Intern): Catching Crime: Detection of Public Safety Incidents using Social Media (WIP)



Early warning detection – situational awareness



CSIR Smart City Platform – Current project



Cyber threat intelligence Sharing



CTIP

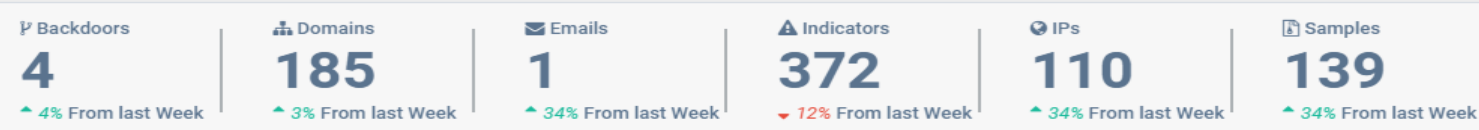
GENERAL

- Home
- View Data
- Add Data
- Services
- Settings
- Help

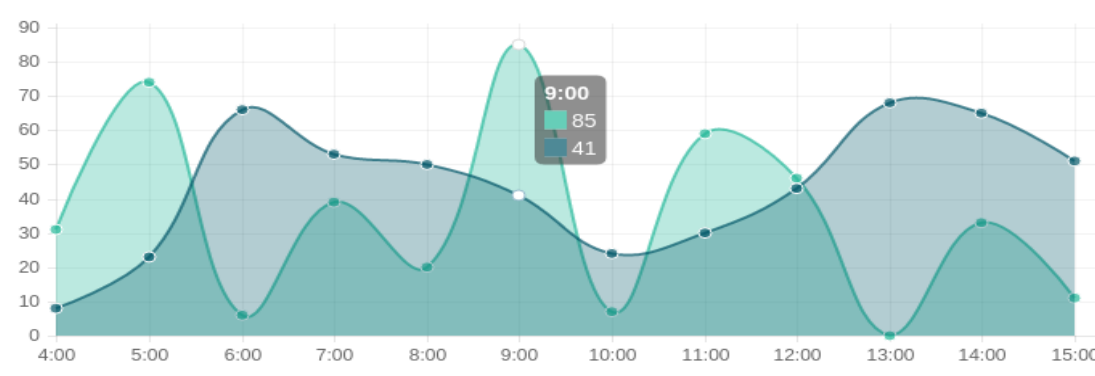
ADMINISTRATOR

- Configuration
- Extras

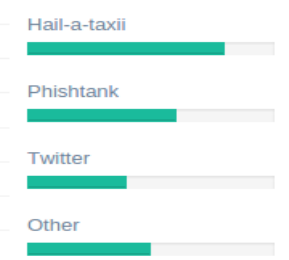
Private Dashboard Welcome crits v



Threat Activity Past 12 hours



Top Data Sources

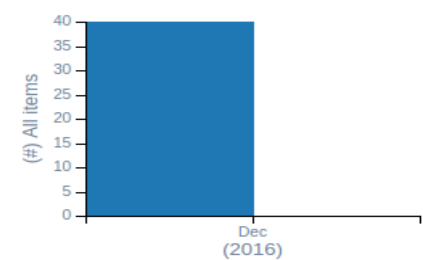


Threat Activity

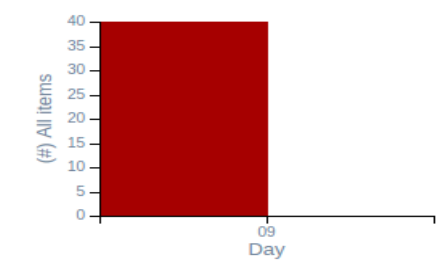
Data Sources



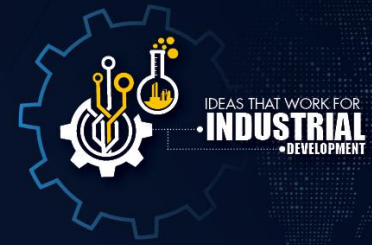
Malicious Samples per Month



Particular Day of the Month



NESL – Cybersecurity Training



CPU **Memory** **Network Nodes** **Network Interfaces**

NESL Memory Summary

Memory Usage (MB)

Time

NESL Memory Rate

Clipboard

Text copied/cut within NESLremote will appear here. Changes to the text below will affect the remote clipboard.

```
setfenv(0) ->IPM 22000 ->eth white ->eth black -->clear
```

Network Management

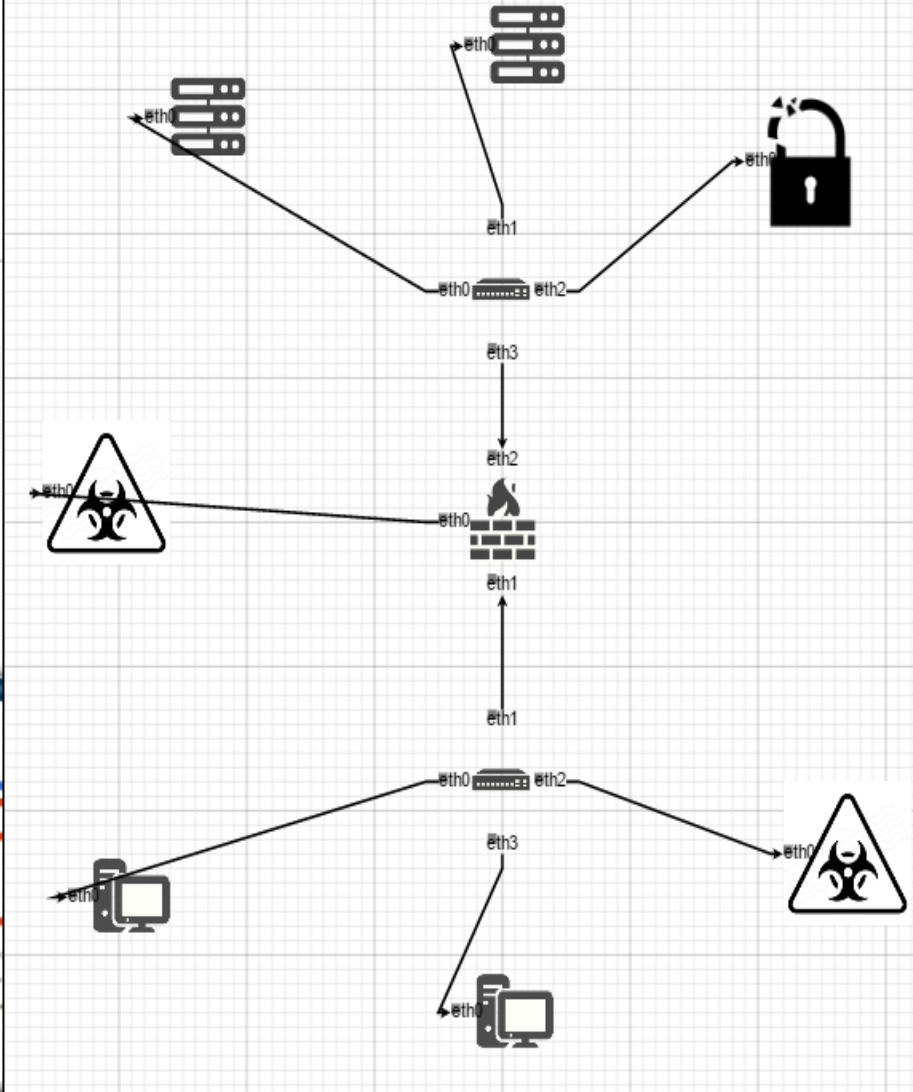
Create New Network Existing Network

NESL_APP_01

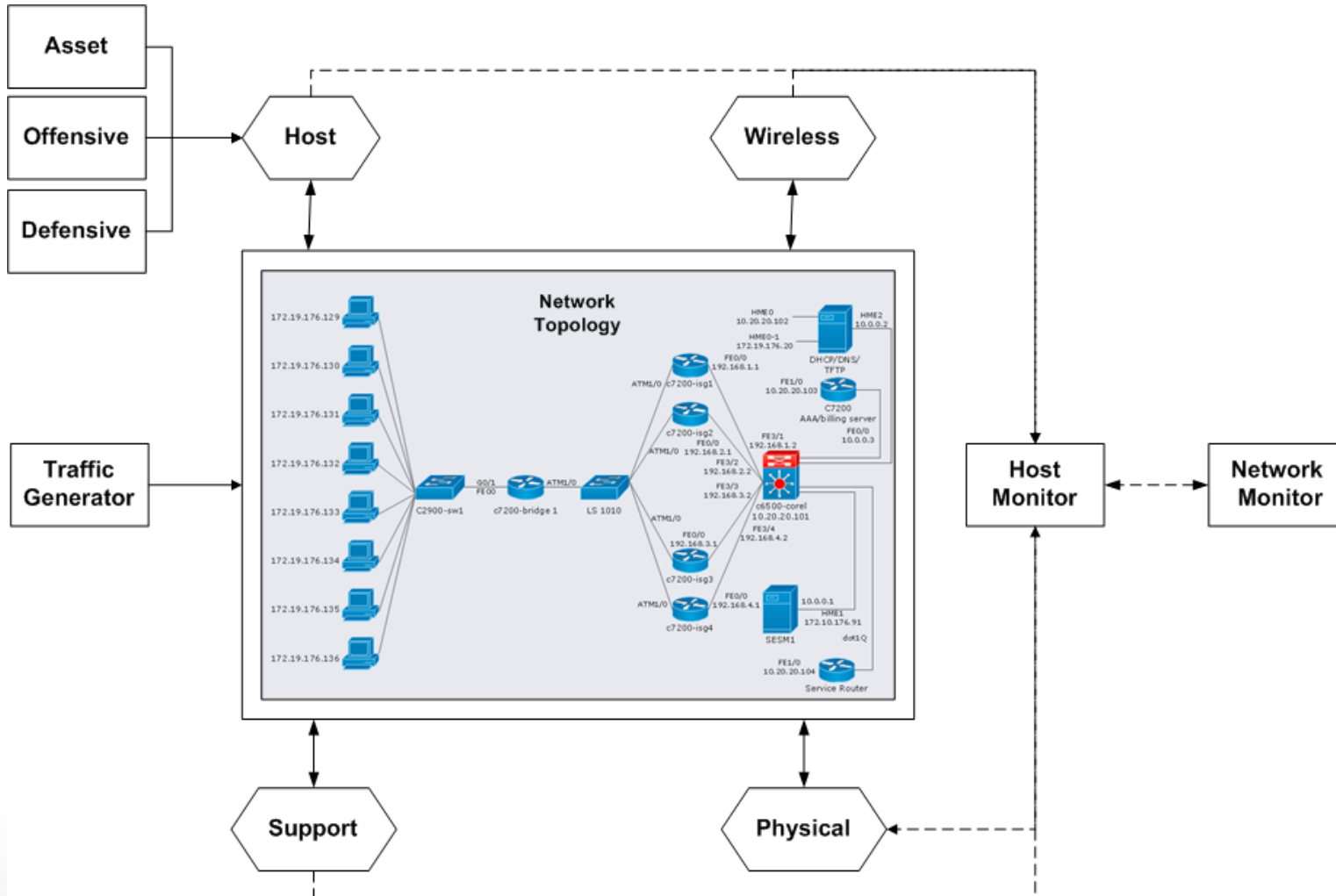
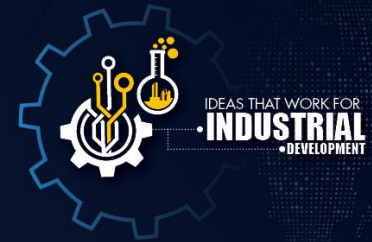
Save Network Stop Network Load Network Clear Network Capture Network Network Summary

Network Creation

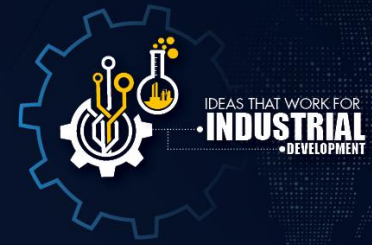
ID	Name	Search reports	Monitors	Time	Monitors	Time
0	Test New NESL 127.0.0.1	exists	exists	2015-07-20 12:20:00	0	0
1.021	NESL Test N Breaking Past Testing!	exists	exists	2015-07-20 12:20:00	0	0
1.022	NESL Test N Breaking Past Testing!	exists	exists	2015-07-20 12:20:00	0	0
1.023	NESL Test N Breaking Past Testing!	exists	exists	2015-07-20 12:20:00	0	0
1.024	NESL Test N Breaking Past Testing!	exists	exists	2015-07-20 12:20:00	0	0
1.025	NESL Test N Breaking Past Testing!	exists	exists	2015-07-20 12:20:00	0	0
1.026	NESL Test N Breaking Past Testing!	exists	exists	2015-07-20 12:20:00	0	0
1.027	NESL Test N Breaking Past Testing!	exists	exists	2015-07-20 12:20:00	0	0
1.028	NESL Test N Breaking Past Testing!	exists	exists	2015-07-20 12:20:00	0	0
1.029	NESL Test N Breaking Past Testing!	exists	exists	2015-07-20 12:20:00	0	0
1.030	Test New NESL 127.0.0.1	exists	exists	2015-07-20 12:20:00	0	0
1.031	Test New NESL 127.0.0.1	exists	exists	2015-07-20 12:20:00	0	0
1.032	Test New NESL 127.0.0.1	exists	exists	2015-07-20 12:20:00	0	0
1.033	Test New NESL 127.0.0.1	exists	exists	2015-07-20 12:20:00	0	0
1.034	Test New NESL 127.0.0.1	exists	exists	2015-07-20 12:20:00	0	0
1.035	Test New NESL 127.0.0.1	exists	exists	2015-07-20 12:20:00	0	0



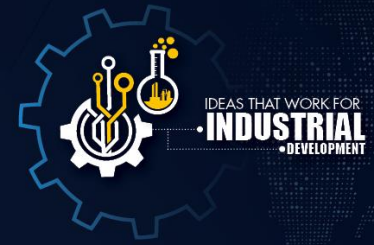
Cyber Range – Security Solutions Testing



Becoming part of the future



Finally...



Robust cyber posture

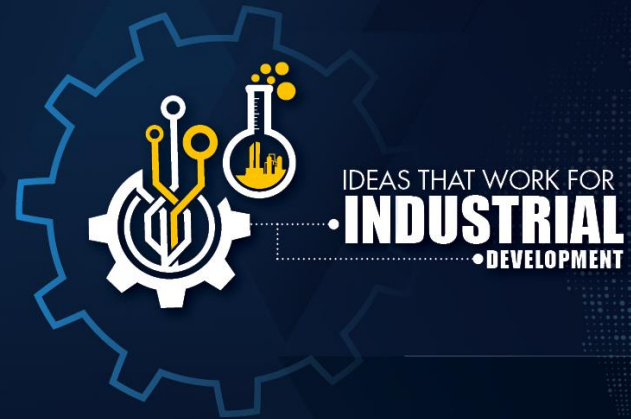
Cyber strategies

Local Context

Sharing of information

Smart buyer/user





Thank You

jmtsweni@csir.co.za

CSIR
our future through science