NATIONAL INTEGRATED CYBERINFRASTRUCTURE SYSTEM

Fortifying the Platform Economy: Cybersecurity Insights for Africa

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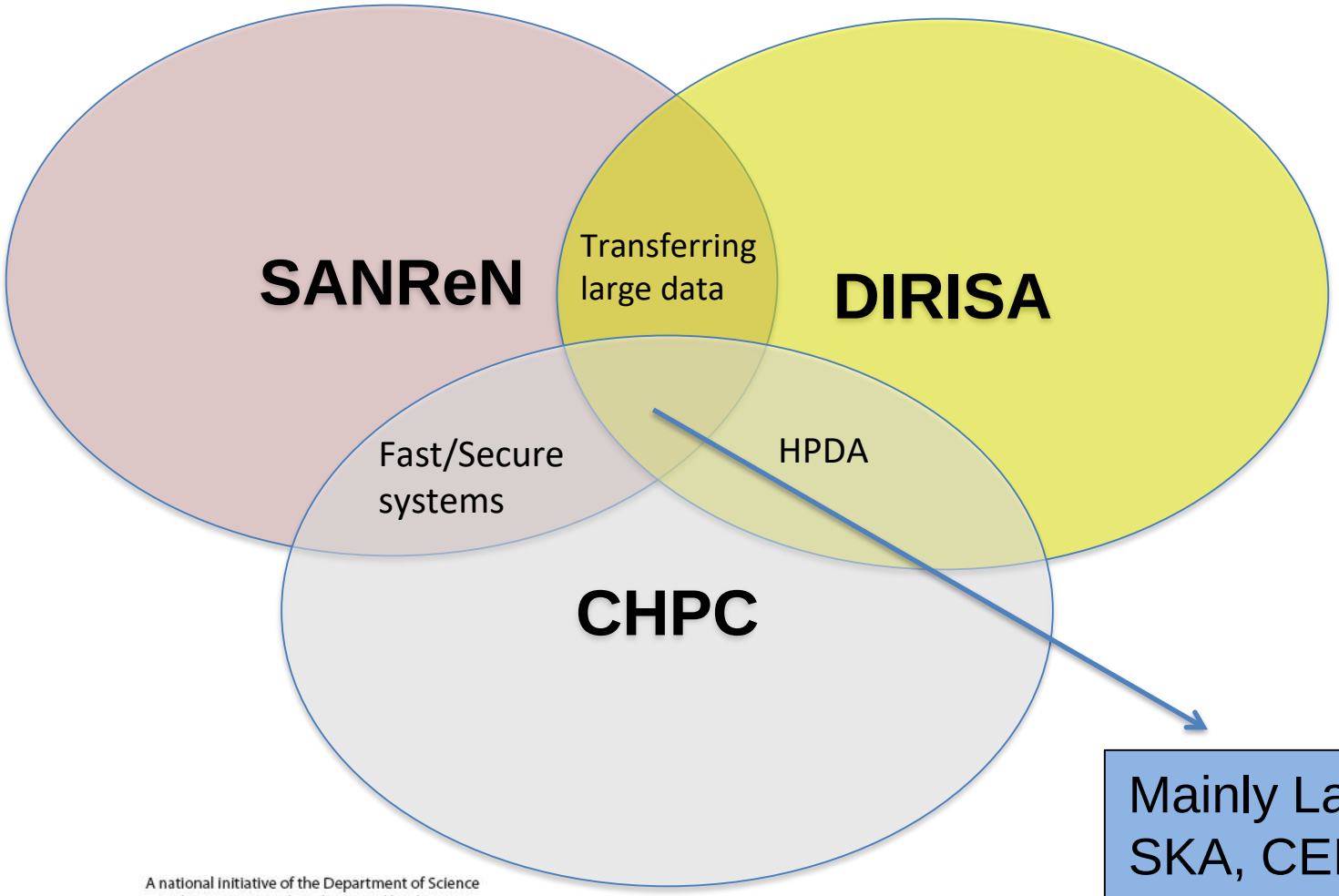
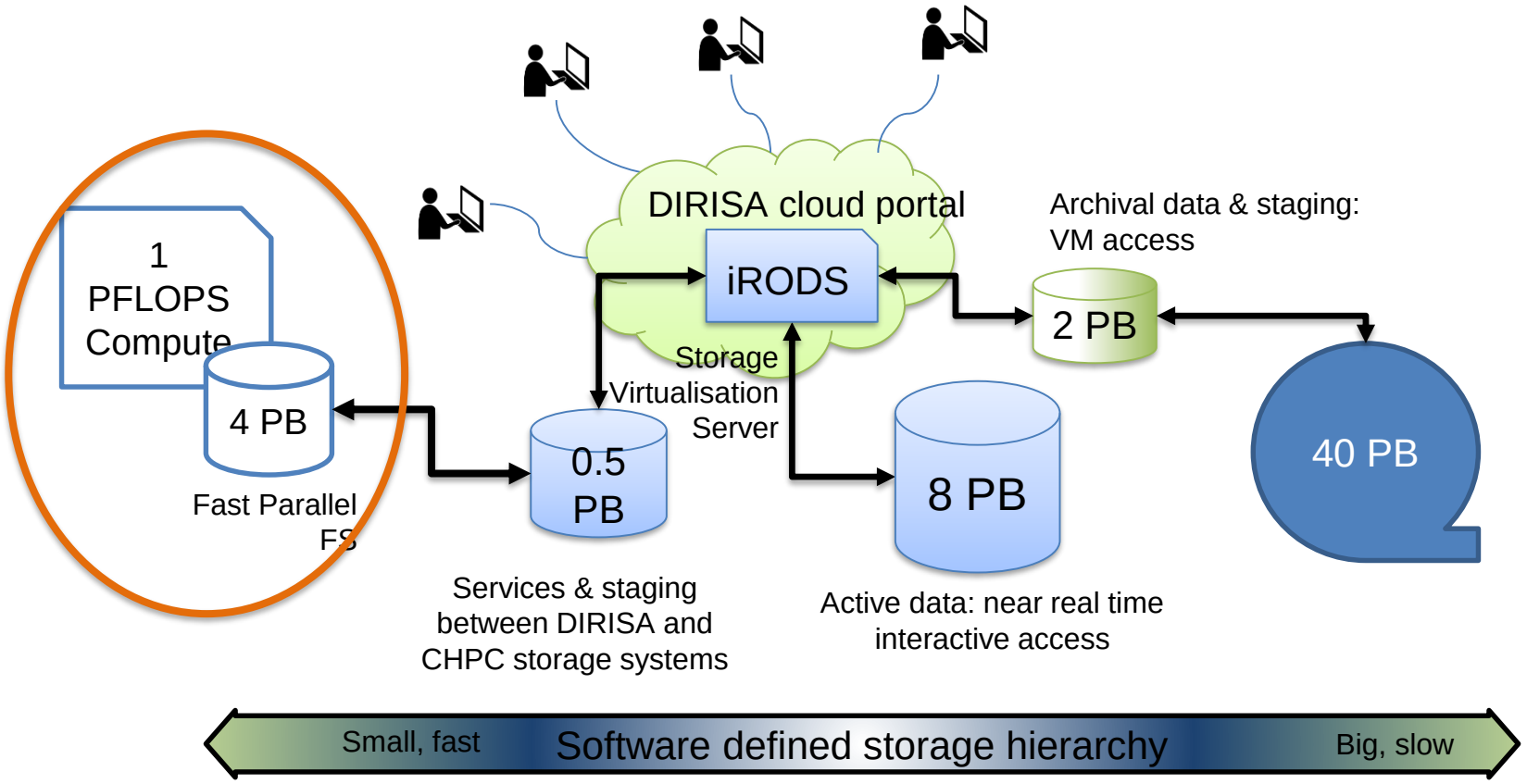


- Common services between any two entities of NICIS
- Intersection of the three entities most crucial, as defines the success of overall NICIS.
- Development of cross-cutting skills internally and within the community

Mainly Large Scale Science projects:
SKA, CERN, 4IR, SADC C.I. Framework, Climate Change (e.g. IPCC)



- Open (FAIR) Data & Open Science
- Federated locally and globally (“One-stop-shop” catalogue)
- Certified as Trusted Repository
- Linked to funder systems
- Suite of services for RDM and data intensive analytics

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Network Infrastructure

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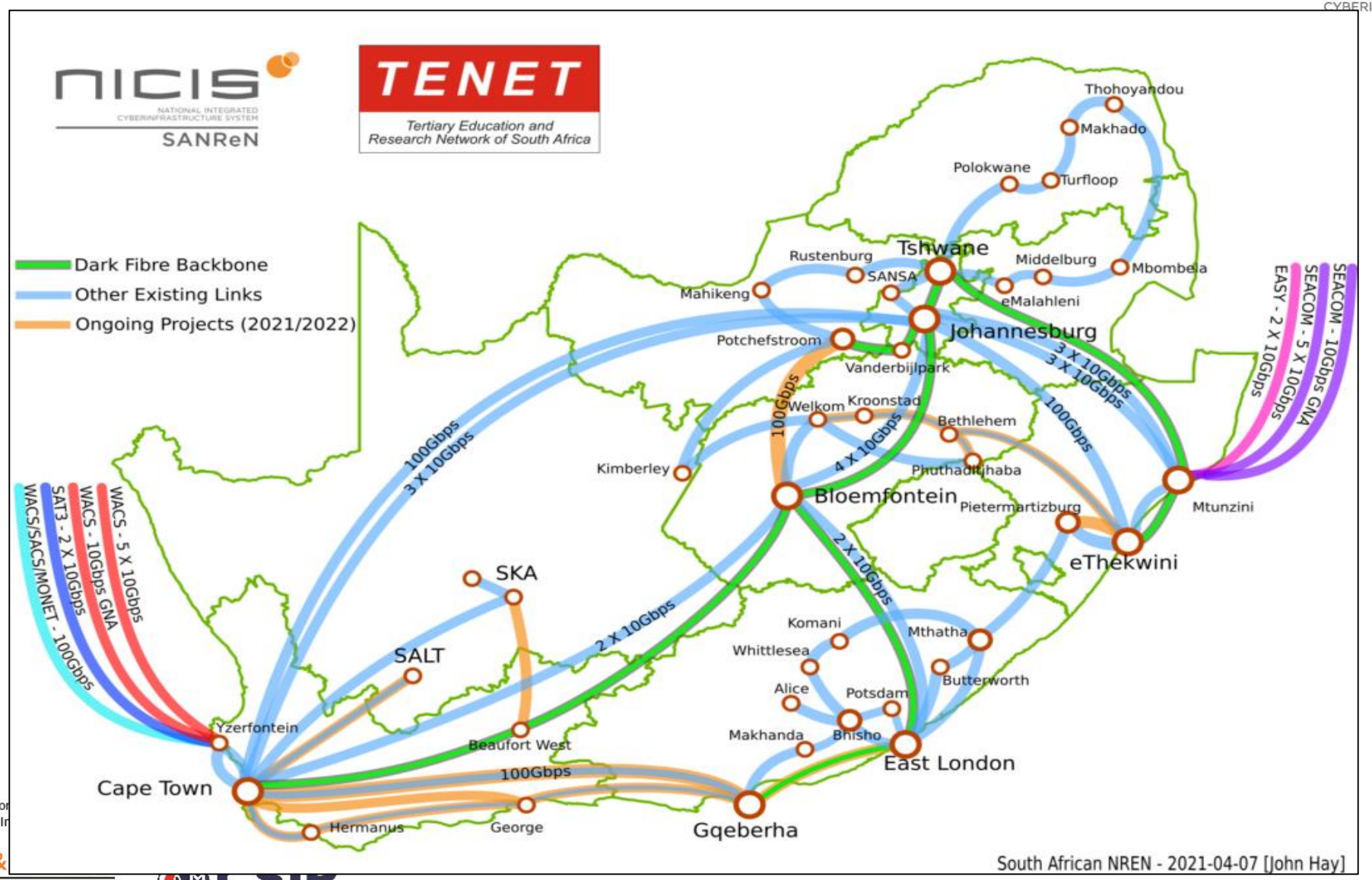

NICIS Platforms

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- Lengau = “Cheetah”
- Installed 2015 with 1.6 PFLOP performance
- 1 345 Nodes of INTEL processors
- Rear-door water cooling system
- 7 Petabytes of Lustre storage
- Close to 100% utilisation

- CERN Tier-2 Grid facility
- Supports ALICE and ATLAS experiments

- GPU Cluster with 9 Nodes each with 4 NVIDIA – V100 processors.
- Mainly used for Machine Learning, Artificial Intelligence and Materials Science applications.

- OpenStack Cloud named SEBOWA
- 52 Nodes with INTEL processors
- Installed in March 2020
- Used for many applications including COVID-19 Data Services

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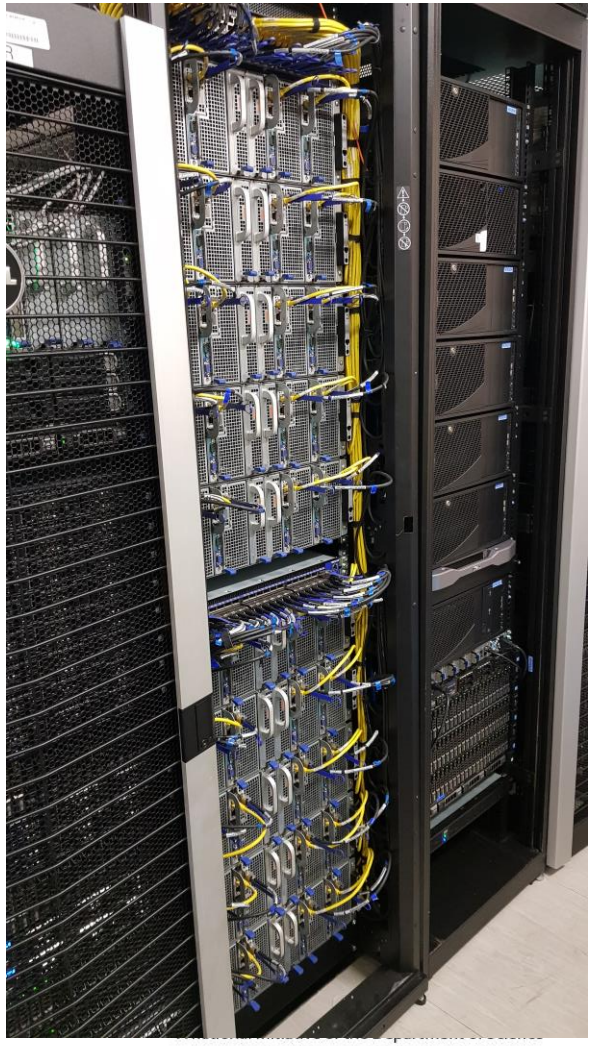
Research in Technology



- Evaluate technology for HPC and cloud
- Investigate and develop technology to improve HPC systems
- Provide a consulting service for HPC and cloud technology
- Collaborate with users with special applications to drive efficiency
- Operate experimental systems

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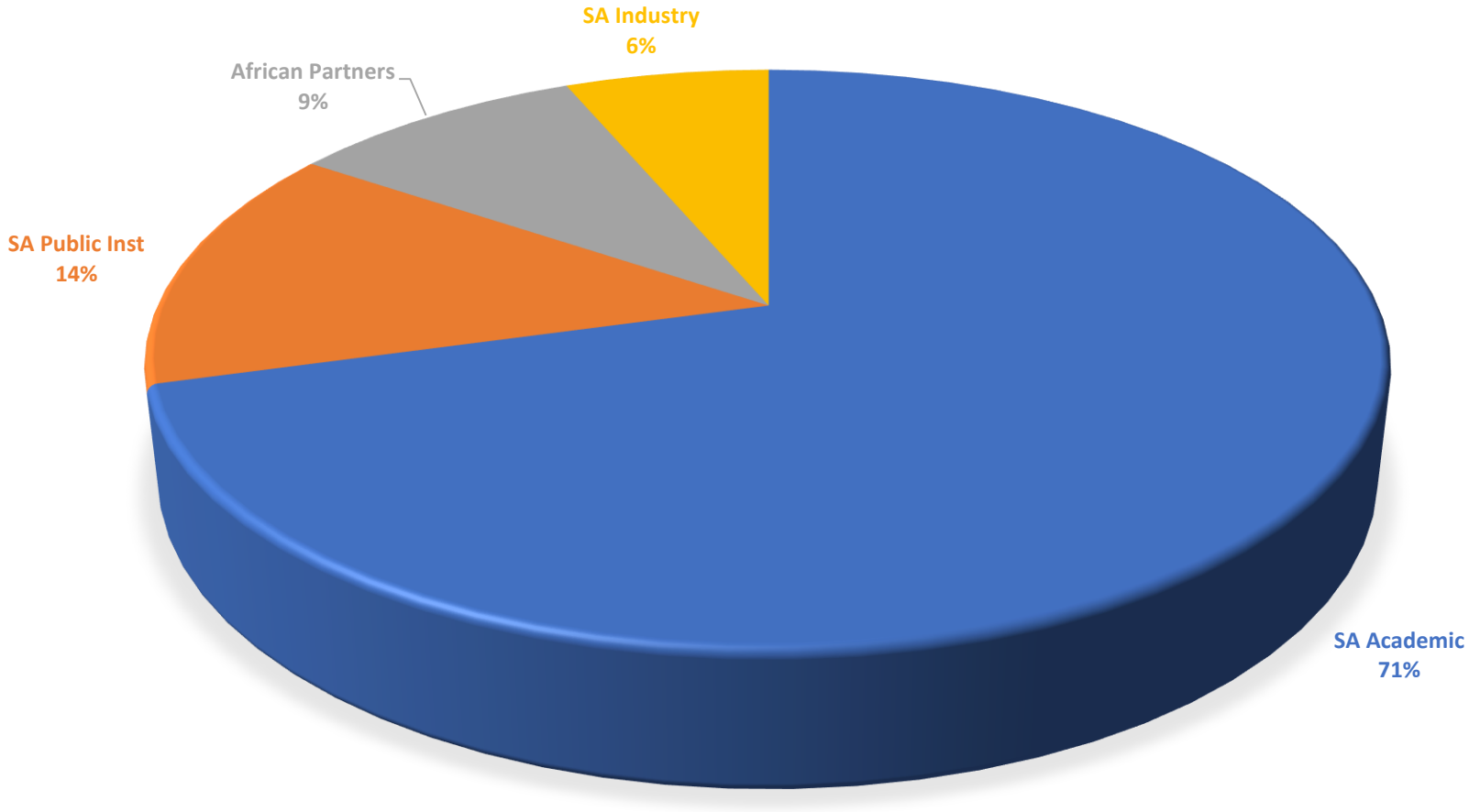
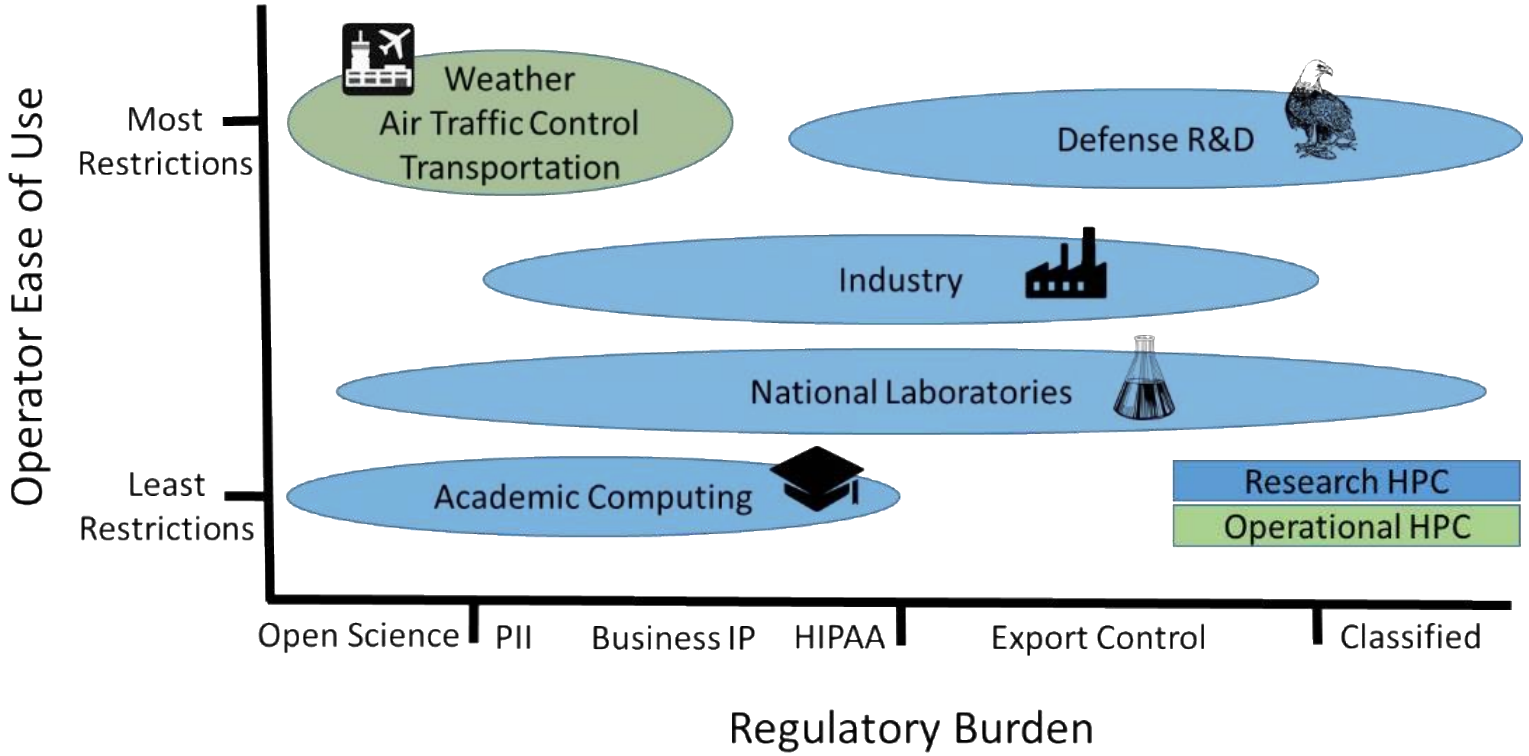
User Categories



Use Cases of HPC Platforms

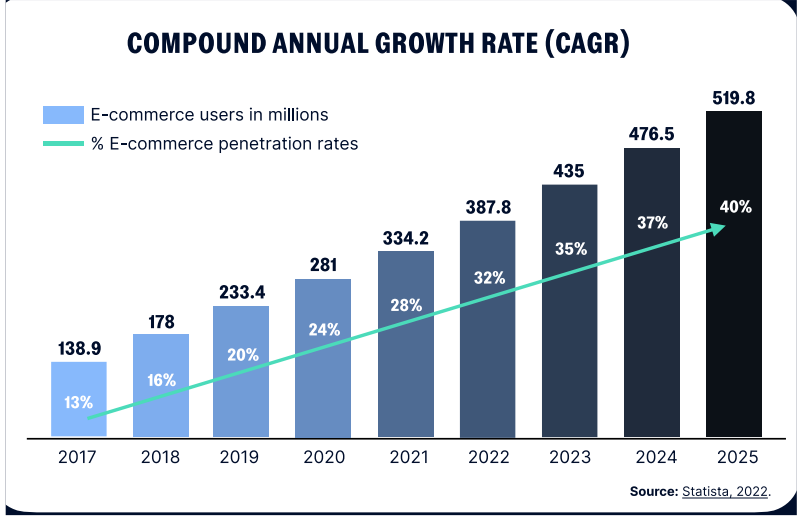
- Various stakeholders in this spectrum require different levels of security protocols
- Some of restrictions might be from Legal obligation to provide security for sensitive information



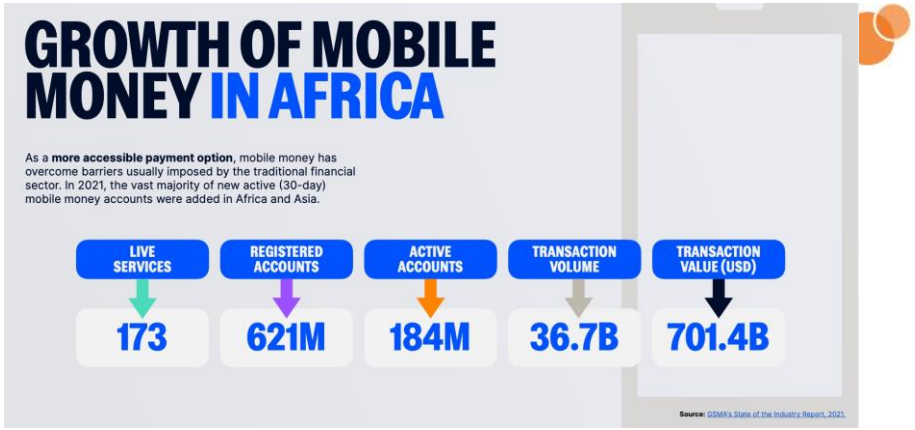
Cybersecurity in platform economy

In an era of digital transformation, the platform economy is rapidly growing in Africa, offering numerous opportunities for economic development and innovation

However, this growth comes with increased cybersecurity challenges that require our attention



519.8 Million Users of ecommerce by 2025



$701.4 Billion

PHONES OVER WALLETS: WHEN AFRICANS PAY, THEY USE CELL PHONES

Mobile money transaction values grew 39% in the continent in 2021. The $701.4 billion in Africa corresponds to about **70% of global values**.

Mobile money allows customers to **receive, deposit, and send money** using a virtual wallet on a mobile phone.

The service is provided by telecom companies, mobile money operators, payment service providers, or banks.

There are **no physical branches**, and the service works through local agents, who facilitate the use of the account and perform cash-in and cash-out transactions.

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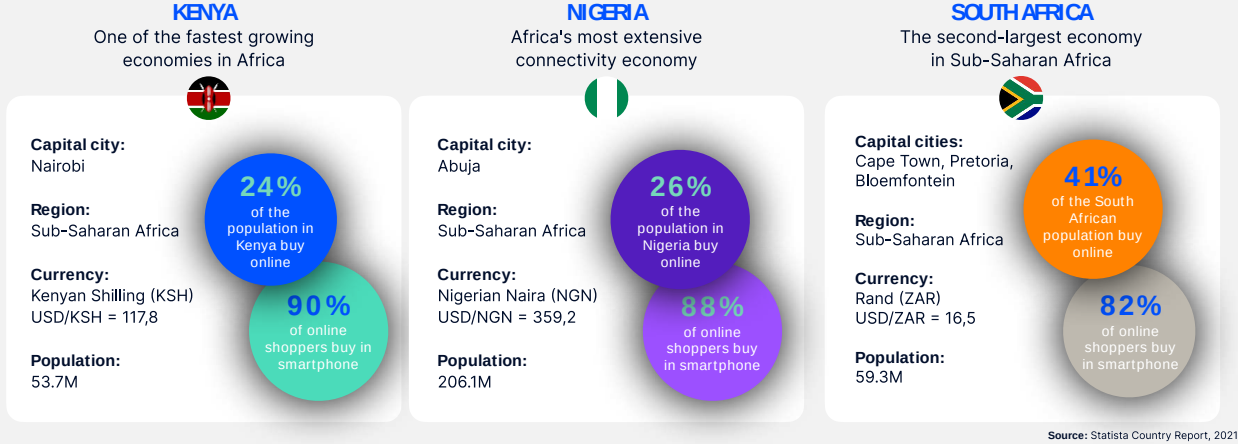
A DEEP DIVE INTO KENYA, NIGERIA, AND SOUTH AFRICA



41% of South African buy online with 82% using smart phones for transactions

Typical Cybersecurity threats

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- Phishing attacks
- Malware and ransomware
- DDoS attacks
- Insider threats
-
  Lack of digital security infrastructure
-
  Hacking

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Strategies to enhance cybersecurity

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- Cybersecurity awareness and education
- Regular security assessments and audits
- Adoption of robust encryption and authentication measures
- Collaborative efforts between business, governments and cybersecurity experts

CSIRT Services

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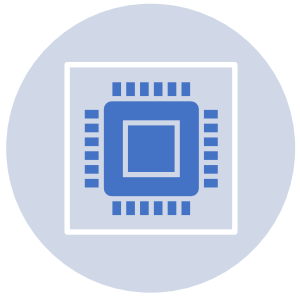
Vulnerability assessments (3 different scans, aggregating results and presenting in actionable report)

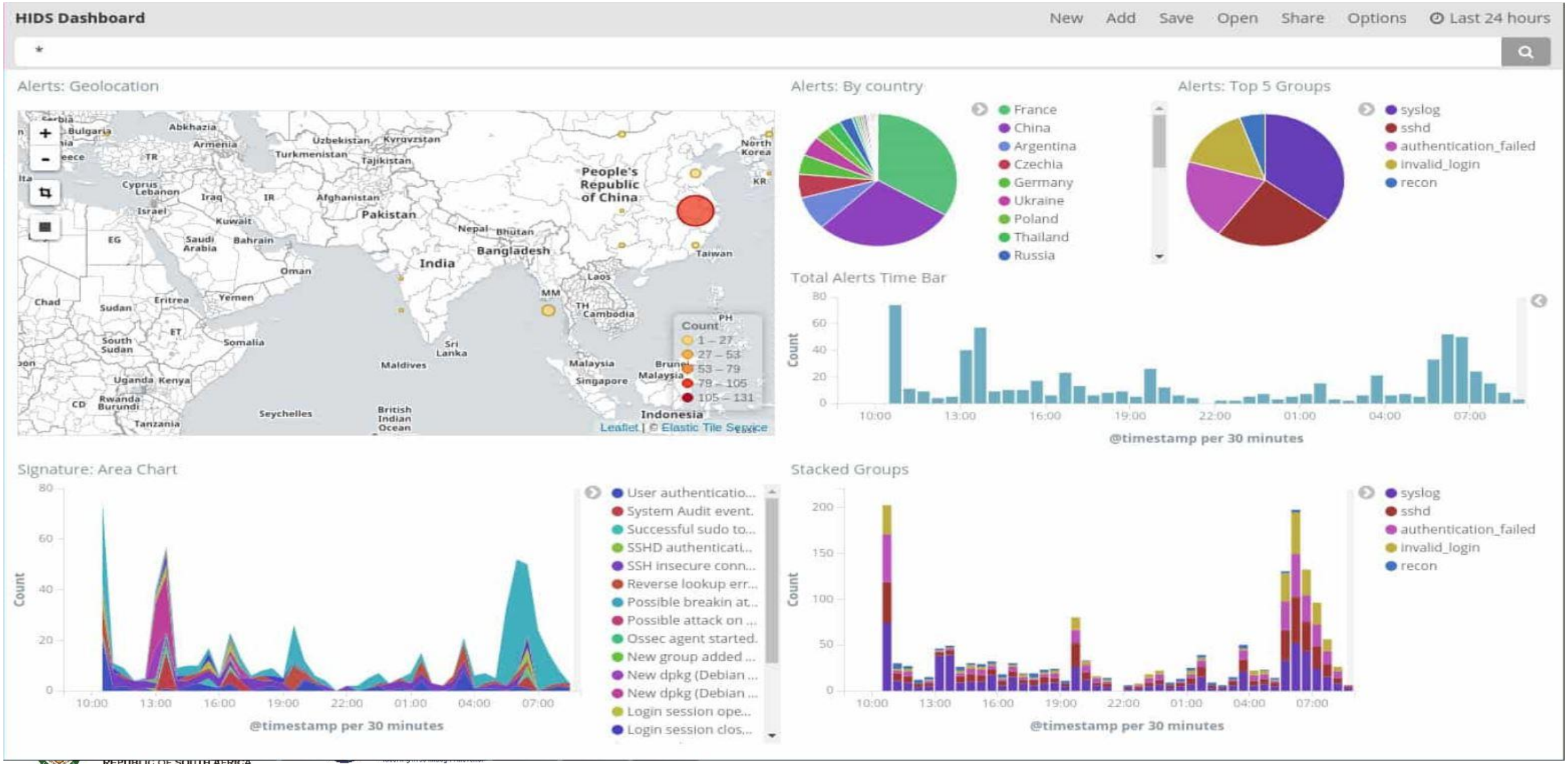


Alerts (correlation of threat intelligence feeds and send to institutions)

Announcements of interesting and relevant information security.

Incident response support and coordination

Attacker gathering system vulnerability



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Skills development initiatives

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Cybersecurity challenge for undergraduate students

Over 600 students from various institutions

Finals held during Annual HPC Meeting

- Capture the flag, Attack and Defend, Decoding Hashes and Social engineering

Collaboration with university in pursuing research in cybersecurity

Rank	Score	Group
1.	310	BitPhase
2.	280	Awesome Source
3.	260	H5N1
4.	116	CyberPunks
5.	104	Insecure
6.	100	Blitzkrieg
7.	80	The 4 Deons
8.	75	PUK1

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Recommendations

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Use data analytics to optimize threat detection and response

Plan for and Invest in organization wide posture in resilience

Embrace functional convergence – collaboration on security within organisation

Focus on the foundational - lack of basic IT hygiene is security risk

Cloud security is key – more rigorous cloud workload hardening

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Website: www.nicis.ac.za

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