



Discover2015



Security for The Machine – A sneak peek at security research from HP Labs

Pratyusa K. Manadhata / June 3, 2015

#HPDiscover

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Session DT1329

Speaker Pratyusa Manadhata

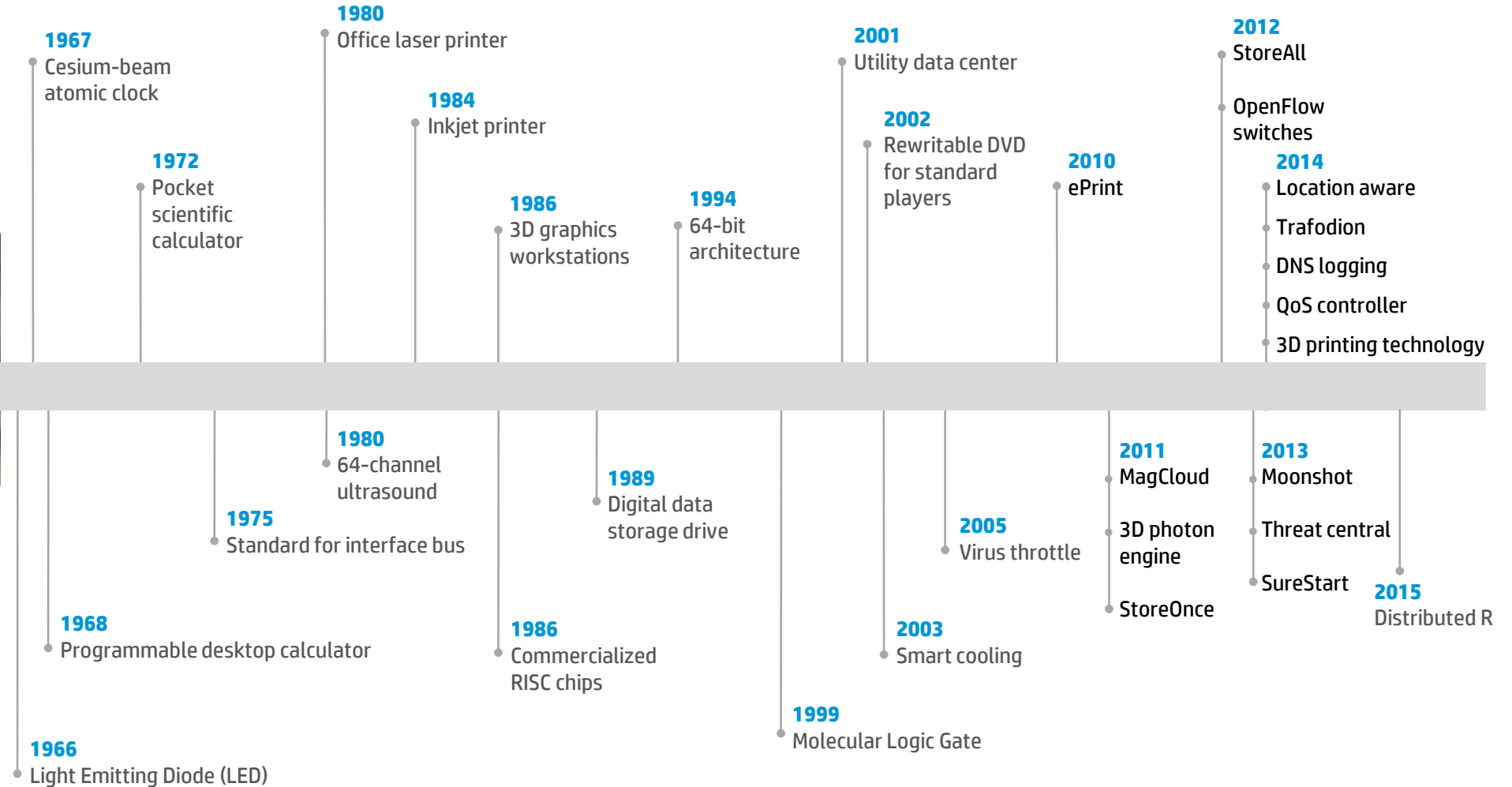
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HP Labs charter

Delivering innovations that transform business, life, and society



Deliver

breakthrough
technologies



Create

opportunities for our
business and customers



Advance

fundamental
science



Engage

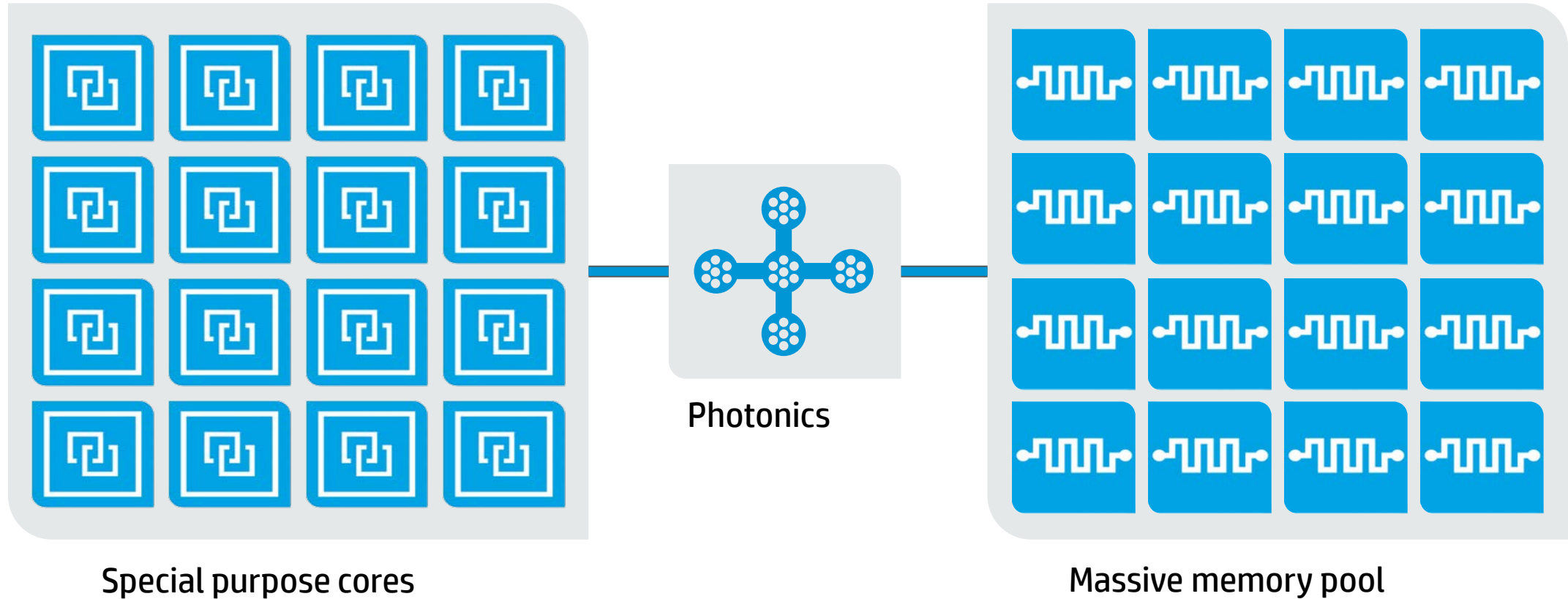
with customers
and partners

The Machine: HP's answer to today's data explosion problem

It will be able to compute much faster with huge amounts of data.

And, it will also take up a lot less space and pull a lot less energy.

The Machine architecture



Security for The Machine

It will be able to compute much faster with huge amounts of data.

And, it will also take up a lot less space and pull a lot less energy.

**It will be much harder for bad guys to break into the machine,
see what's inside, destroy anything or steal anything.**

Challenges in securing The Machine

Security is always a challenge, but much more in the context of The Machine



Scale



New architecture



Vanishing control points

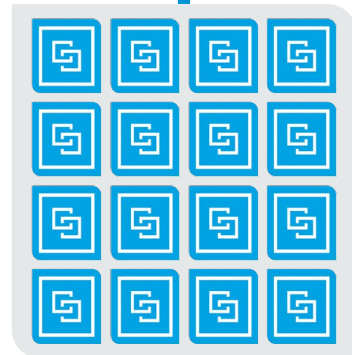
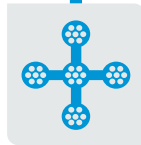
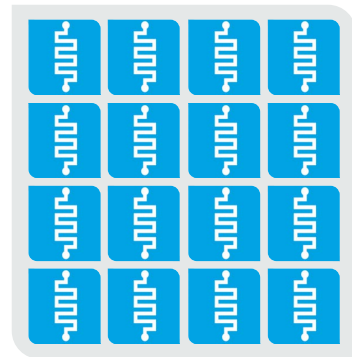


Performance bottleneck



Resource constraints

A Security framework



Protect



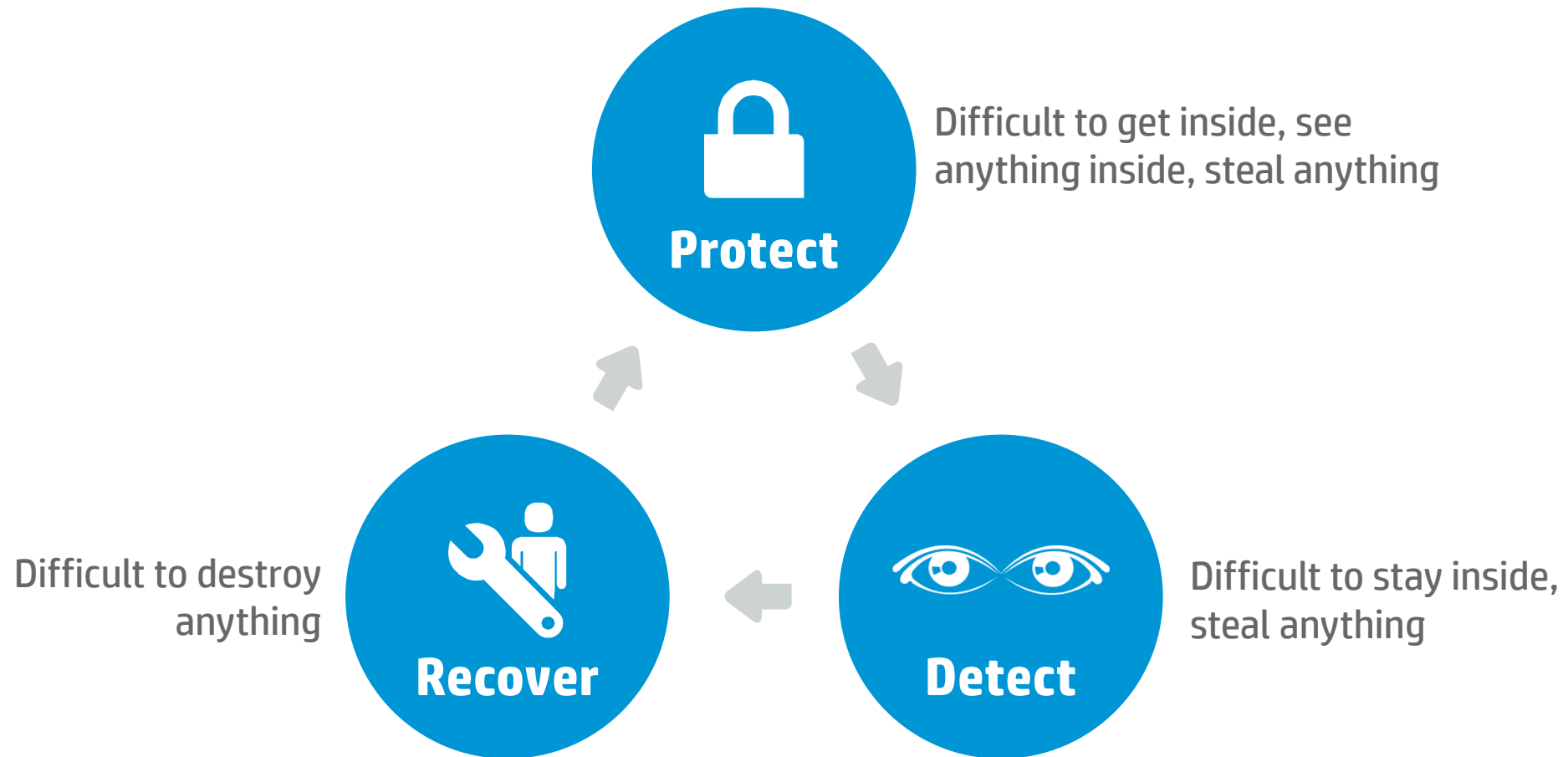
Detect



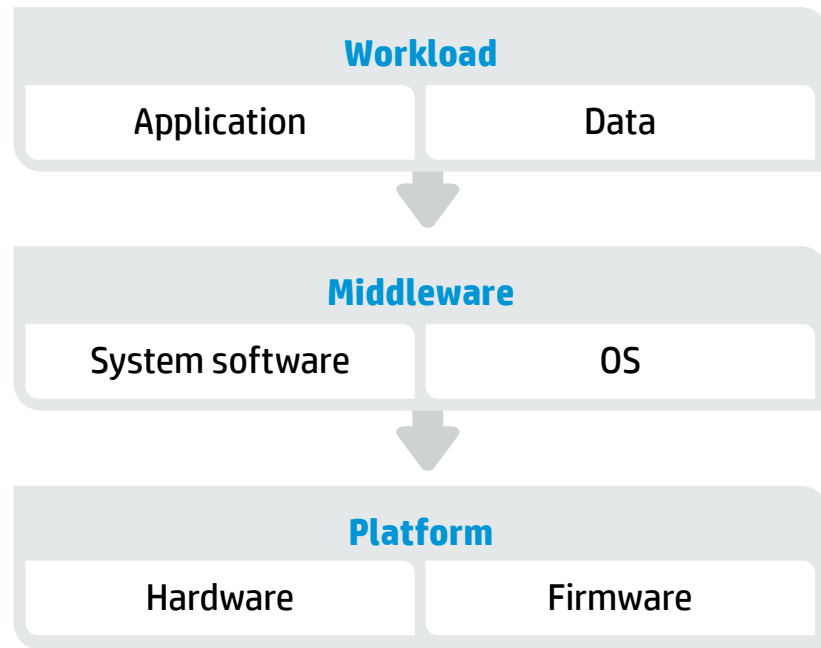
Recover



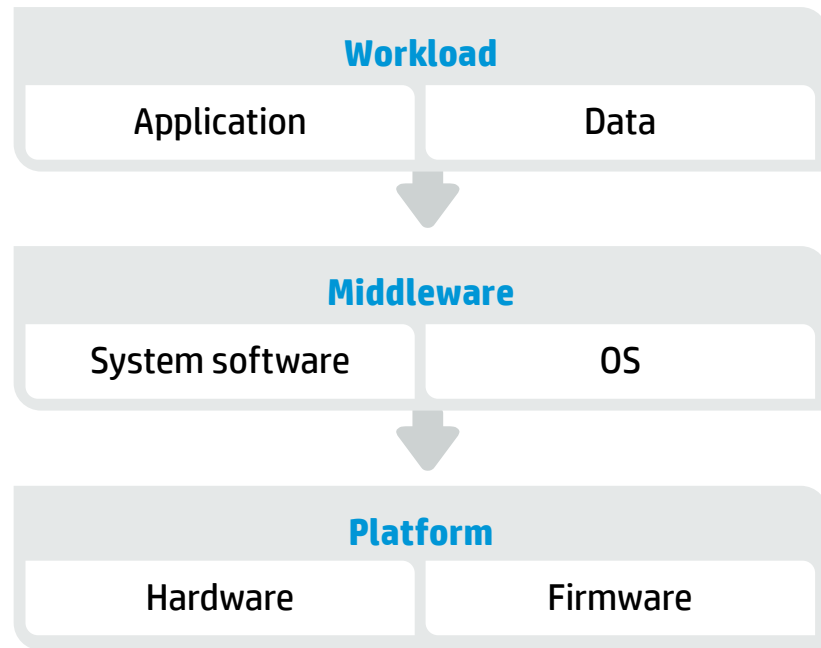
The 'Protect-Detect-Recover' framework...



...designed from the ground up...

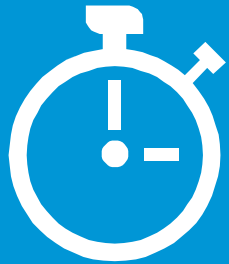


...with built-in primitives...



**Security Information
and Event Management
(SIEM), Proxy, ..**

...and the following goals.



Efficient



Resilient

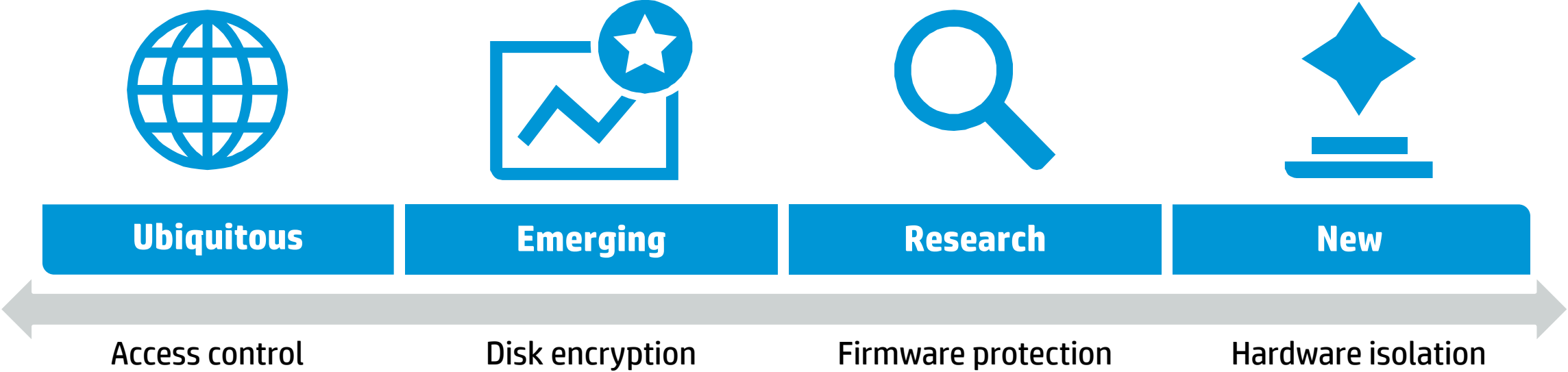


Scalable



Manageable

Technology



Protect: Prevent malicious actions

Some examples are:



**Integrity
protection:** secure
boot and firmware



**Run time
monitoring**

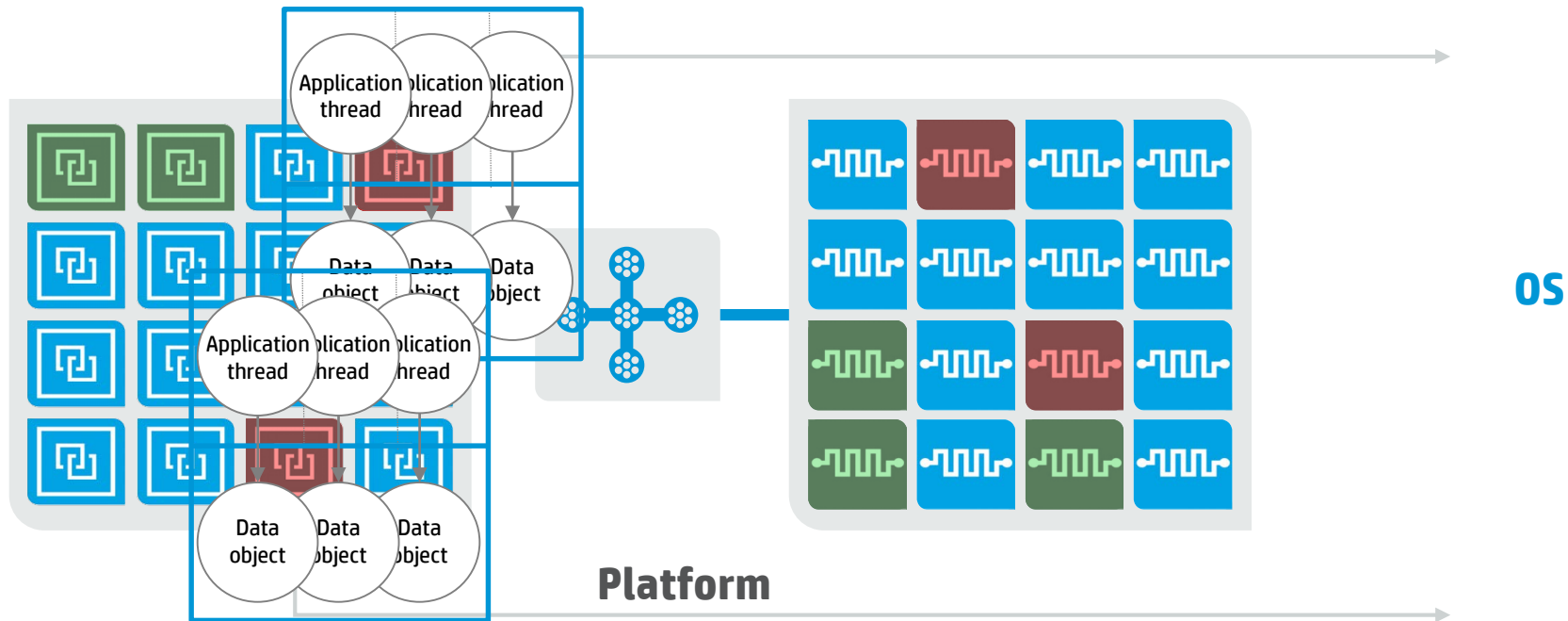


**Access
control**

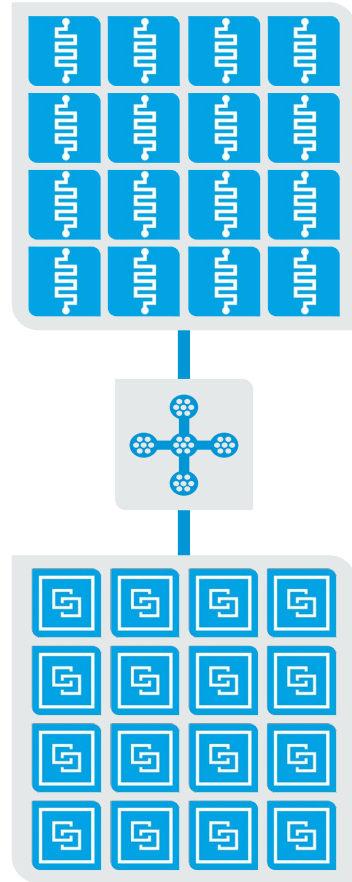


Data protection:
low energy encryption

Protect: Access control at different layers



Protect: Data protection



Data at rest

Data in motion

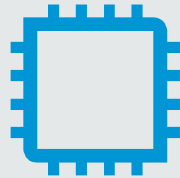
Data in use

Detect: Detect malicious actions

Some examples of detection “in The Machine”



**Detect compromised/
malicious hardware
components**



**Detect firmware and
kernel tampering**

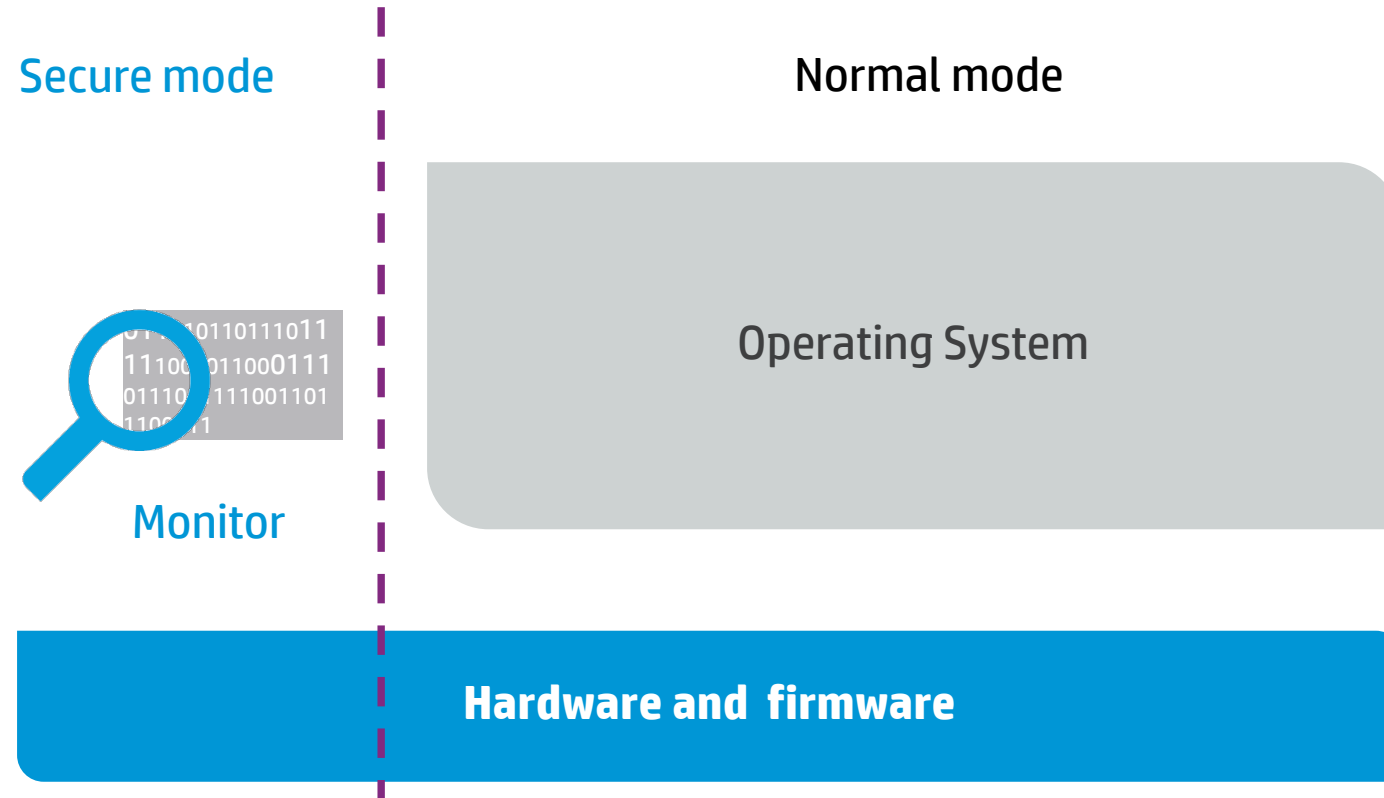


**Runtime monitoring
for malware detection**



**Monitoring for data
leakage**

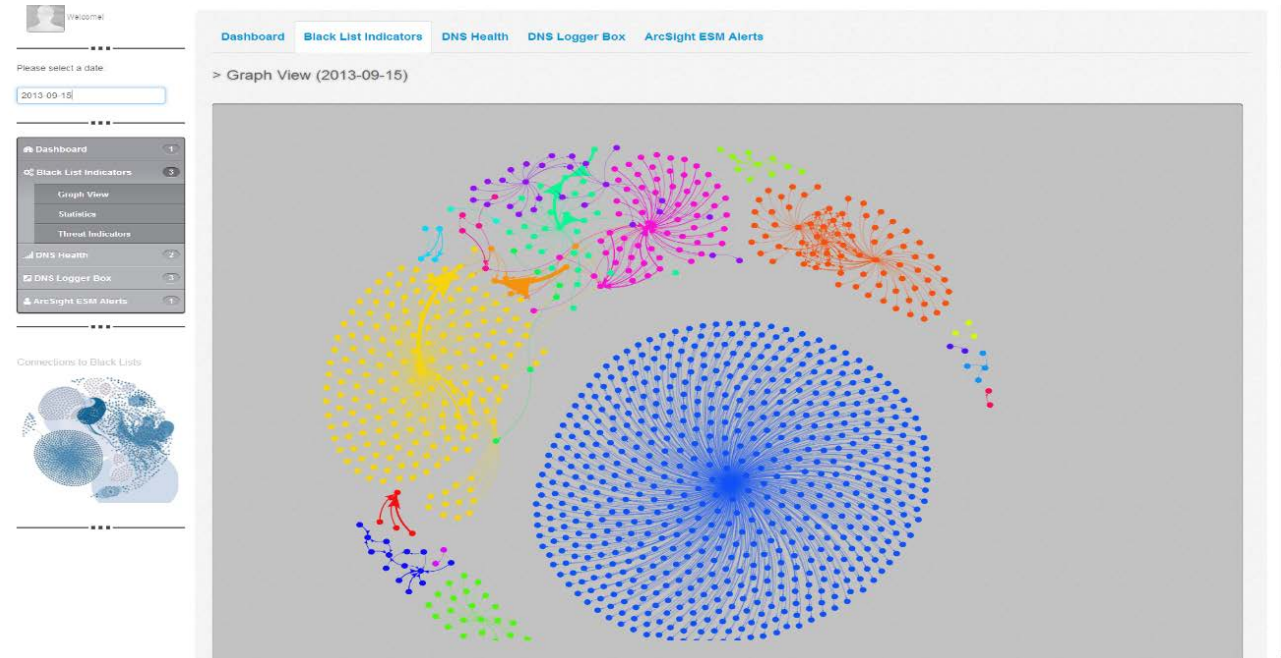
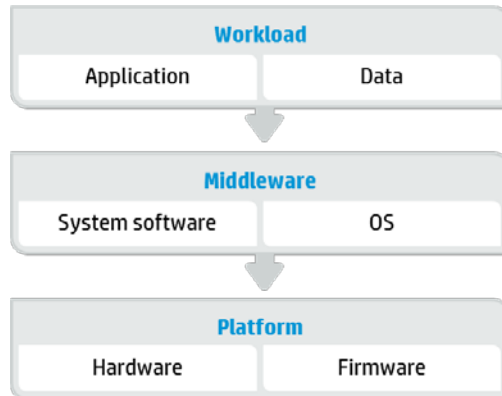
Detect: Tamper-proof monitoring/introspection



Detect: Primitives to enable detection “outside The Machine”



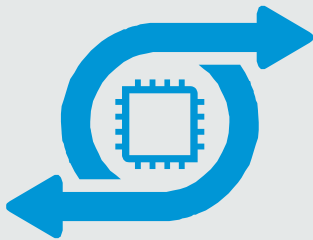
Primitives/APIs for event generation and remediation/recovery action



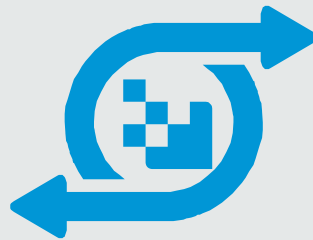
DNS Analytics

Recover: Recover from malicious actions

Some examples are:



**Recovery at the
firmware layer**



**OS, application, and
data recovery**

**Systematic
recovery at scale
with minimal
human
intervention**

Recover: Recover from kernel level malware

Out-of-band integrity measurements trigger an alarm



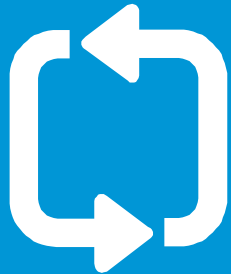
- Perform secure reboot to restore to trusted state
- Freeze machine core and send for forensic analysis
- Migrate workload to new core
- Turn on advanced monitoring

Summary

- An opportunity to design and implement security from the ground up
- Security is not an afterthought, but a conscious design decision



Efficient



Resilient



Scalable



Manageable

Learn more about HP Labs and The Machine

Attend these sessions

Wednesday, 12:30 pm – 1:00 pm

- **DF1332** – Bringing Consistency and agility to data center management – A conversation with HP Labs

Wednesday, 4:30 pm – 5:00 pm

- **DT1328** – Management at Scale for the New Style of IT – Introducing Loom from HP Labs

Thursday, 11:30 am – 12:00 pm

- **DT1330** – Reimagining systems and application software for The Machine – A sneak peek from HP Labs

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After the event

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Thank you

Pratyusa K. Manadhata
Manadhata@hp.com

