HBGary

DETECT. DIAGNOSE. RESPOND.

Solutions for Memory Forensics & Automated Malware Reversing

HBGary
DETECT. DIAGNOSE. RESPOND.

HBGary Background

- Founded in 2003
  - Government R&D
- Solutions:
  - Enterprise Malicious Code Detection
  - Live Windows Memory Forensics & Incident Response
  - Malicious Code Detection
  - Automated Reverse Engineering

R&D Funding

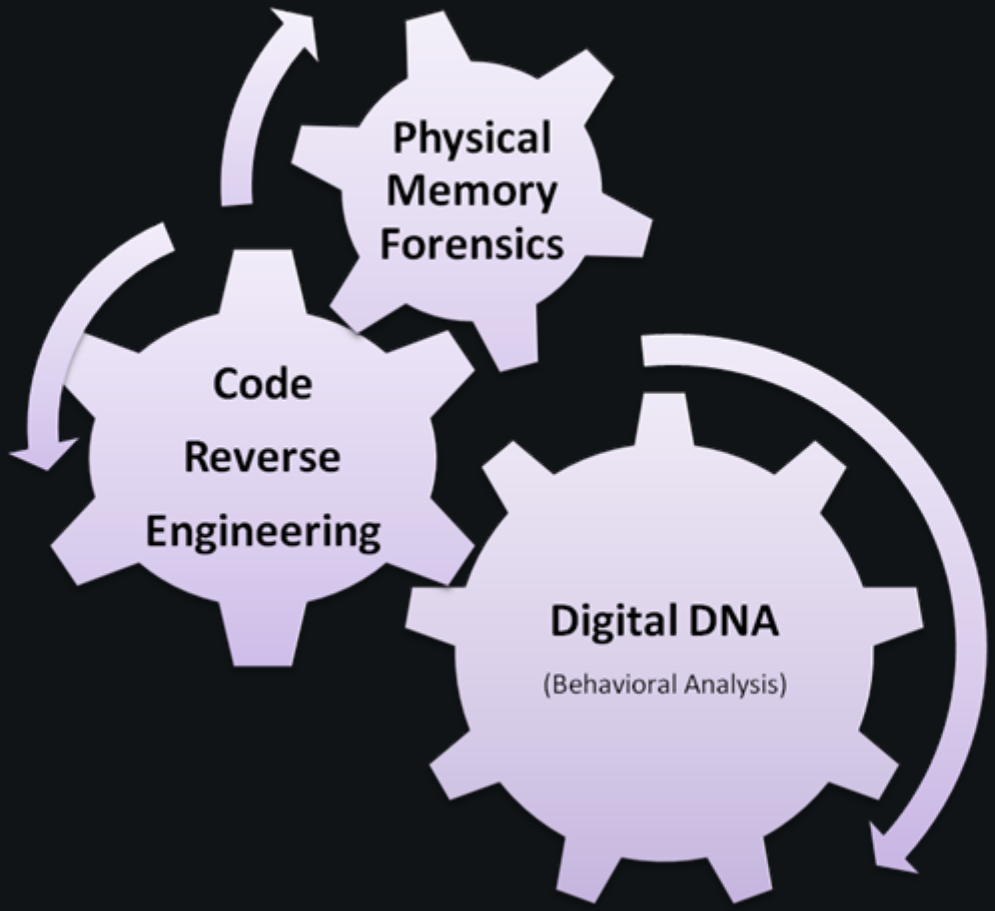
Air Force Research Labs

- Next Generation Software Reverse Engineering Tools
- Kernel Virtual Machine Host Analyzer
- Virtual Machine Debugger

Dept Homeland Security (HSARPA)

- Botnet Detection and Mitigation
- H/W Assisted System Security Monitor
  - Subcontractor to AFCO Systems Development

3 Core Technologies



Technology and Workflow

Offline Physical Memory Analysis

- Unprecedented Visibility
  - "Automated Crash Dump Analysis"
    - No code executing to "actively" fool our analysis

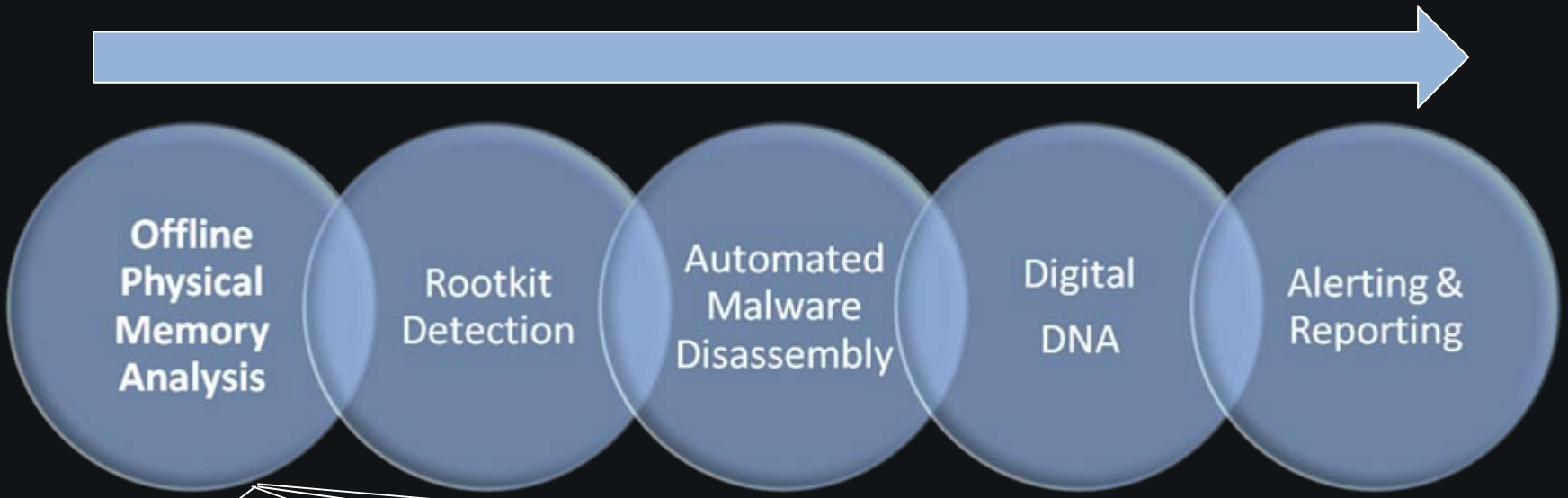
Automated Malware Analysis

- Rapidly Identify the malicious code capabilities
- Generate Report

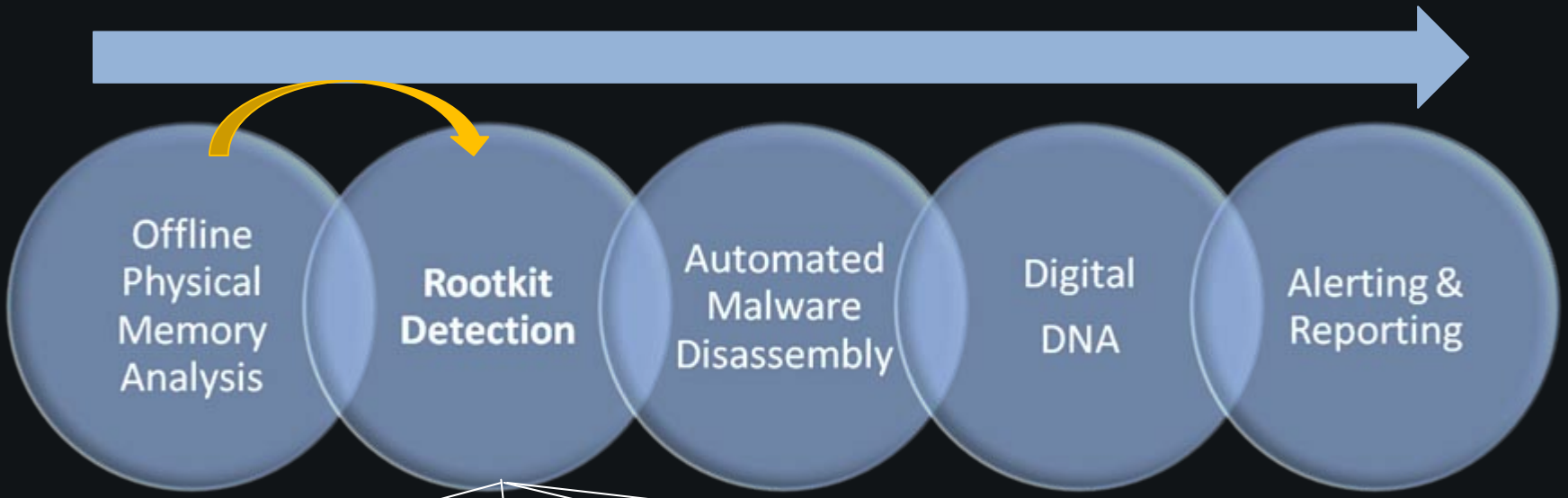
Enterprise Policy Change

- URL's and IP address blocking
- IDS/IPS – Detection and Blocking Rules
- Identify Scope of Breach
- Develop and Implement Optimal corrective action plan

The Core Technology



The Core Technology



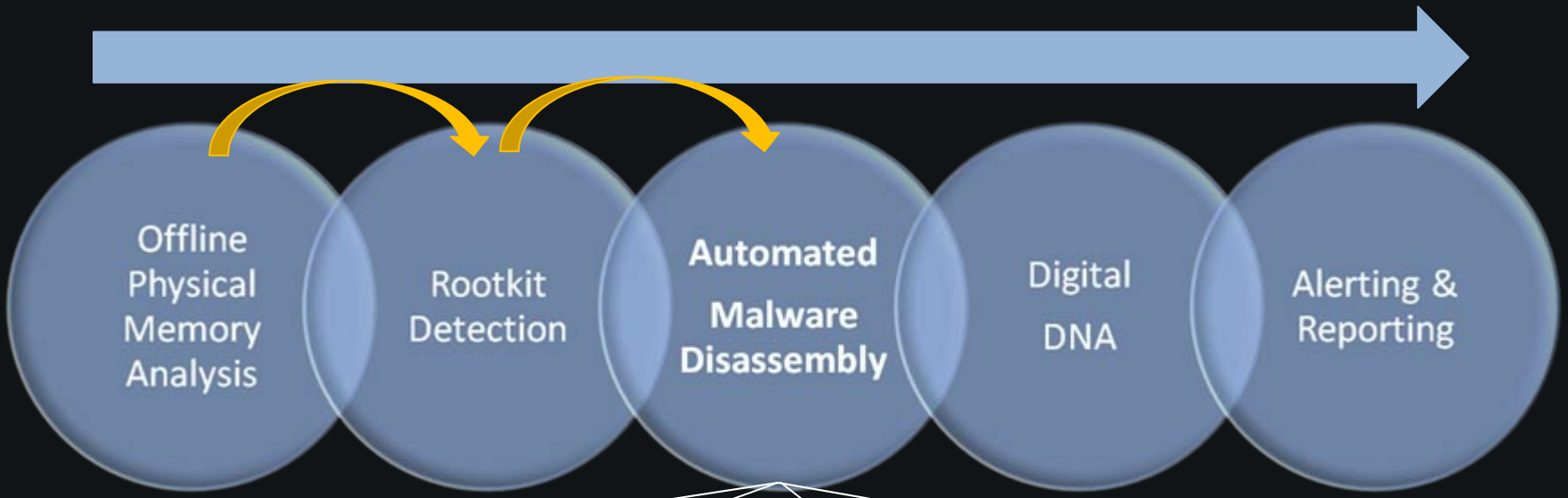
These tricks expose themselves by interacting with OS

Direct Kernel Object Manipulation Detection

Hook Detection
IDT/SSDT/Driver Chains

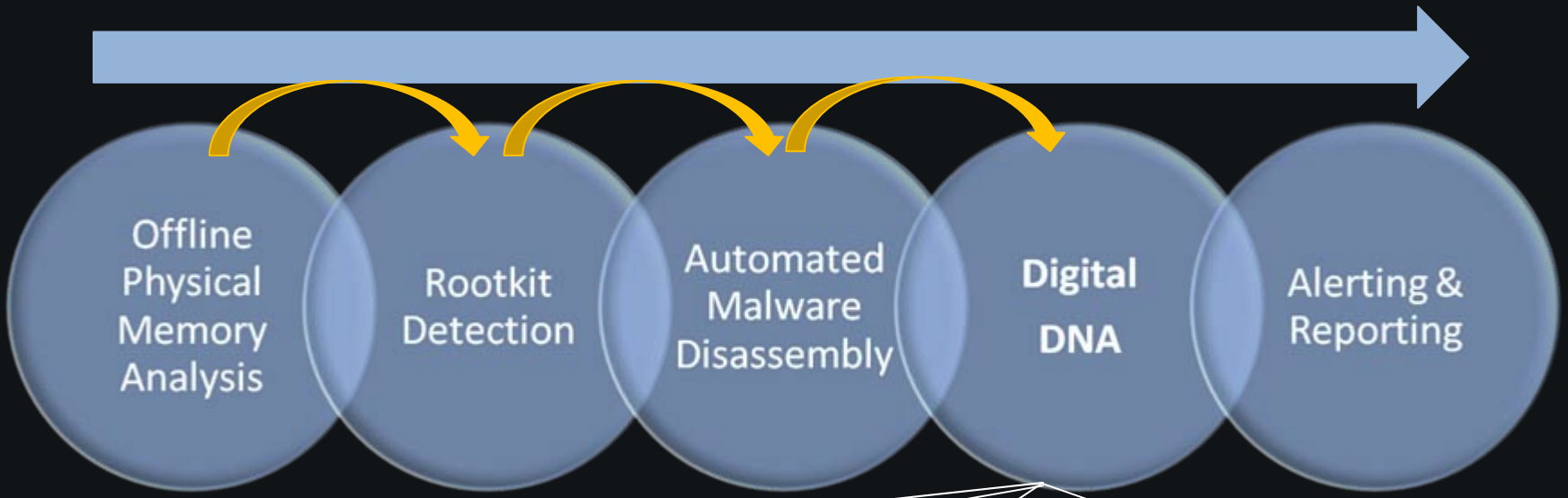
Crossview Based Analysis

The Core Technology



- Suspicious Code is extracted from RAM
- Code is Disassembled, broken apart, and analyzed
- Integration with Flypaper & Flypaper Pro
- Code Control Flow Graphing

The Core Technology



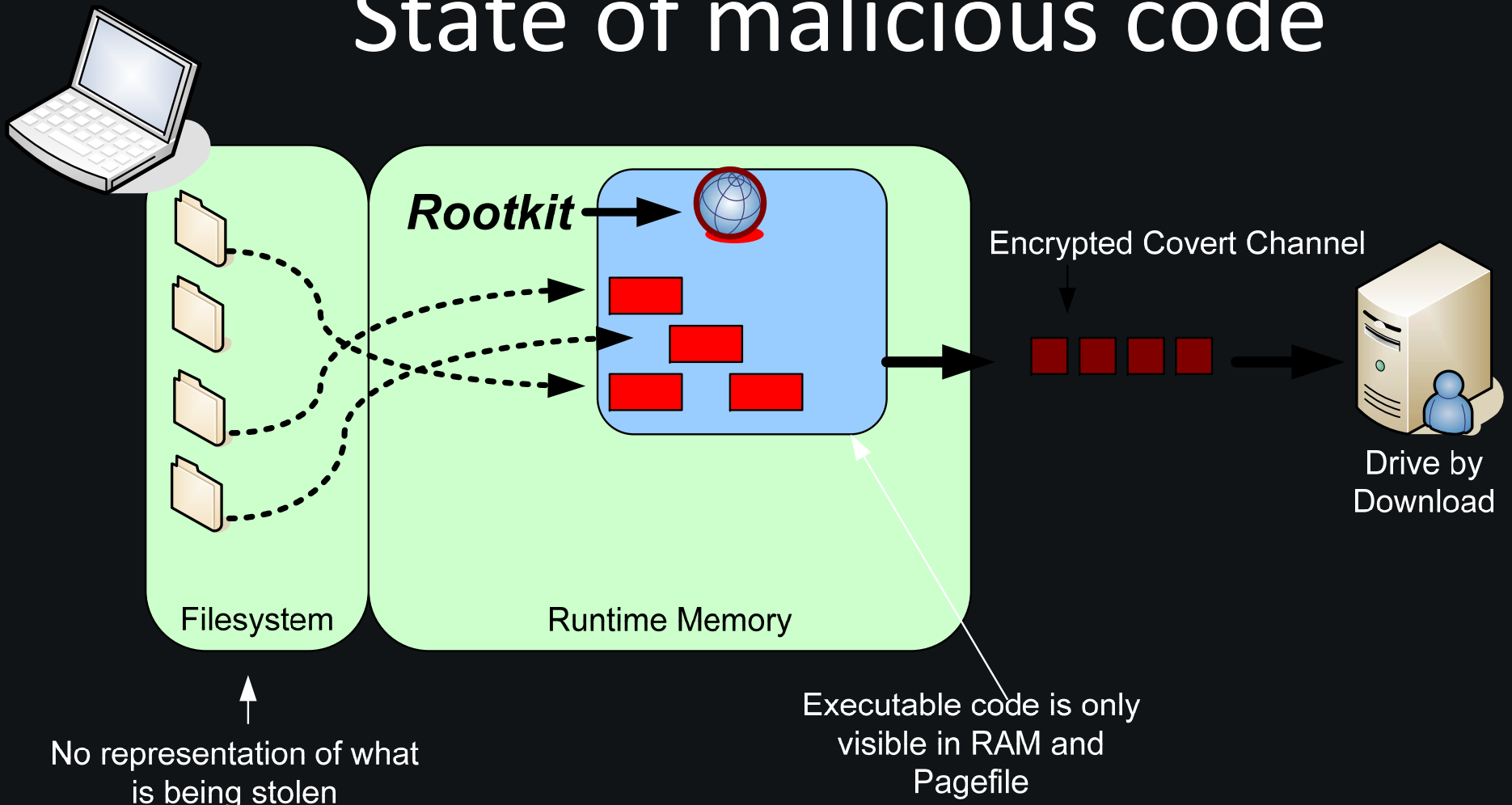
- Identifies executable code behaviors
- DDNA created for all executable code
- A Threat Score is provided for all code
- White & Black List
  Code /Behaviors

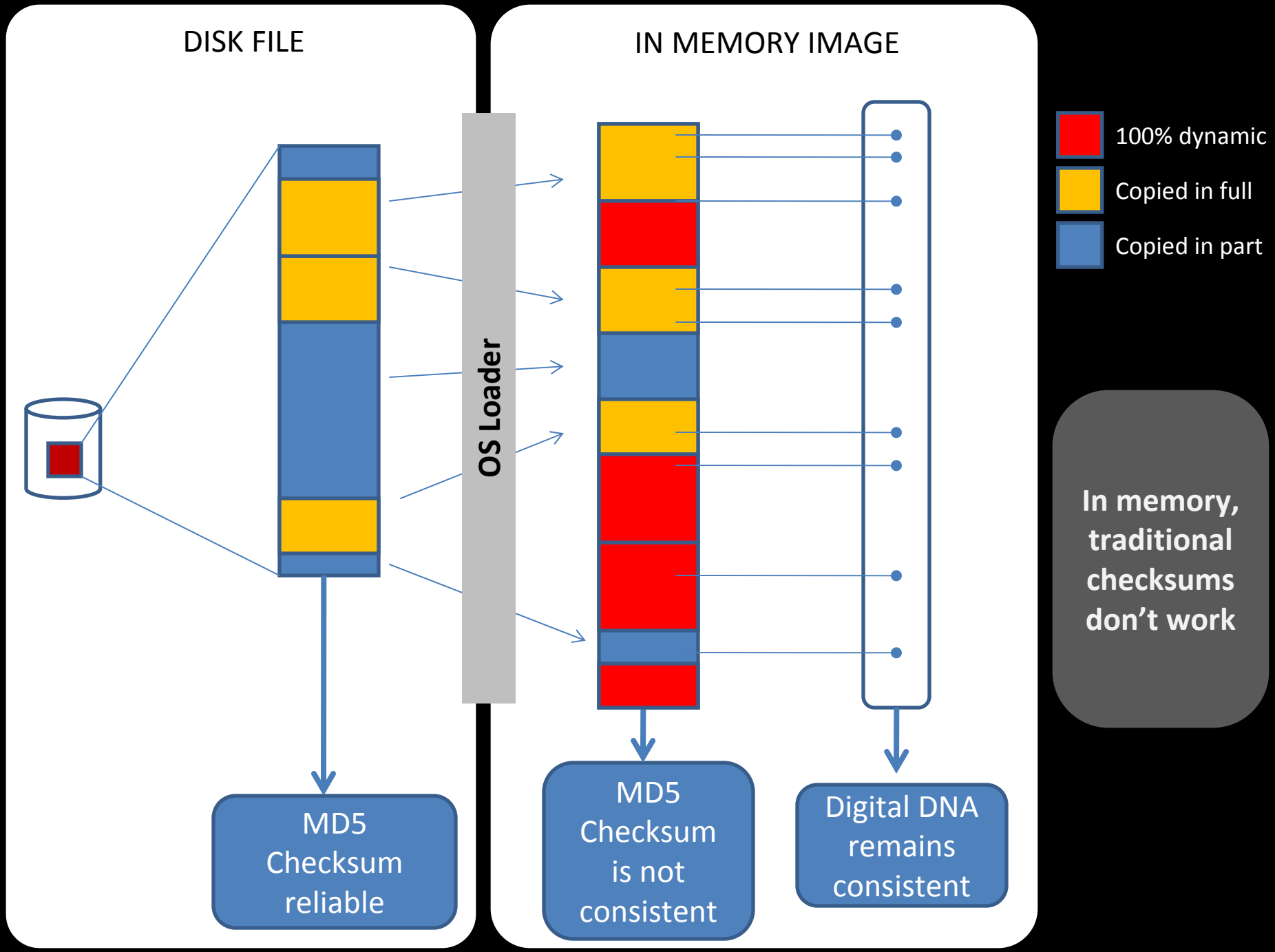
MD5 Doesn't Work in Memory... so we created Digital DNA.

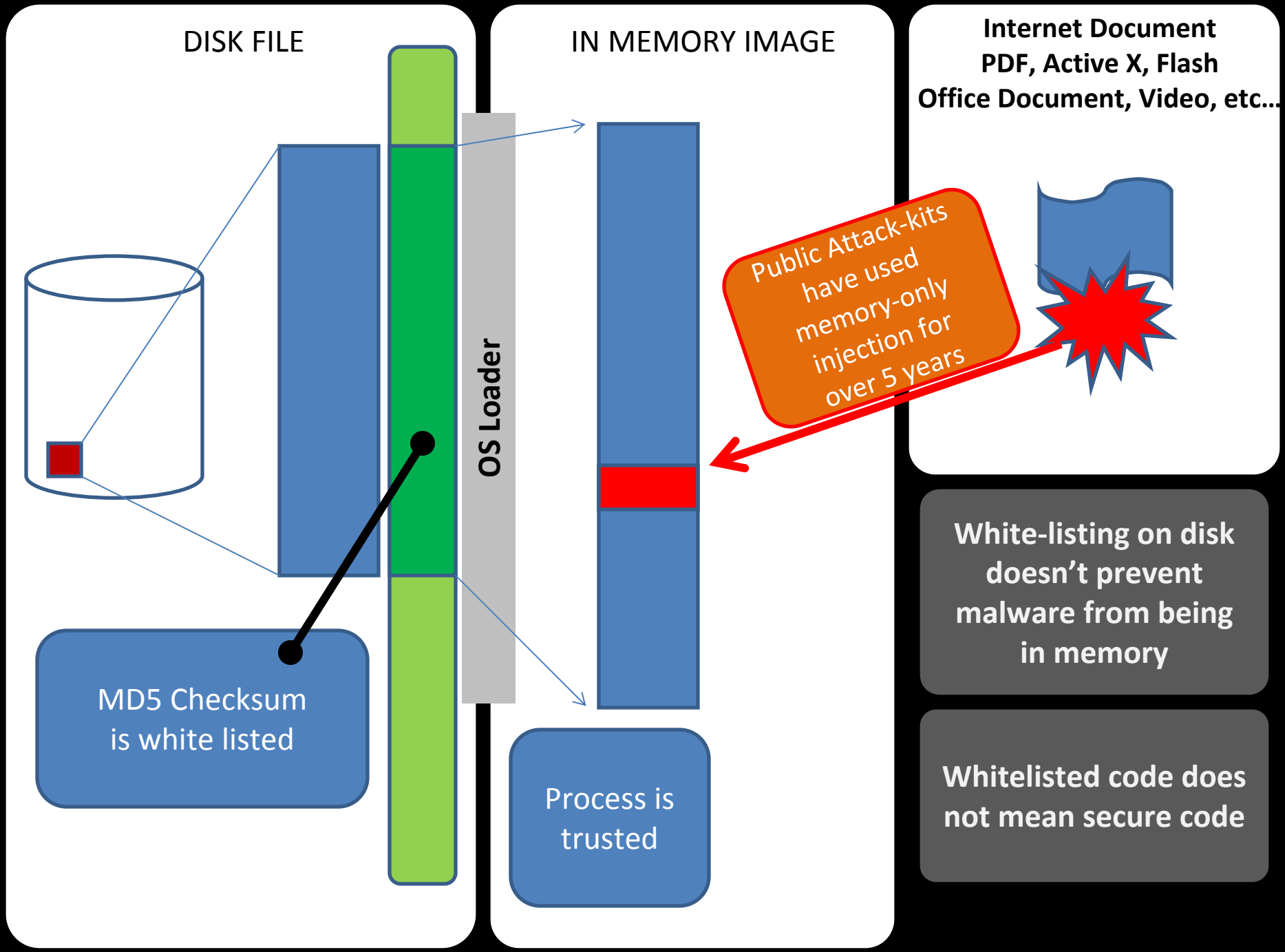
Why MD5's Don't Work in Memory

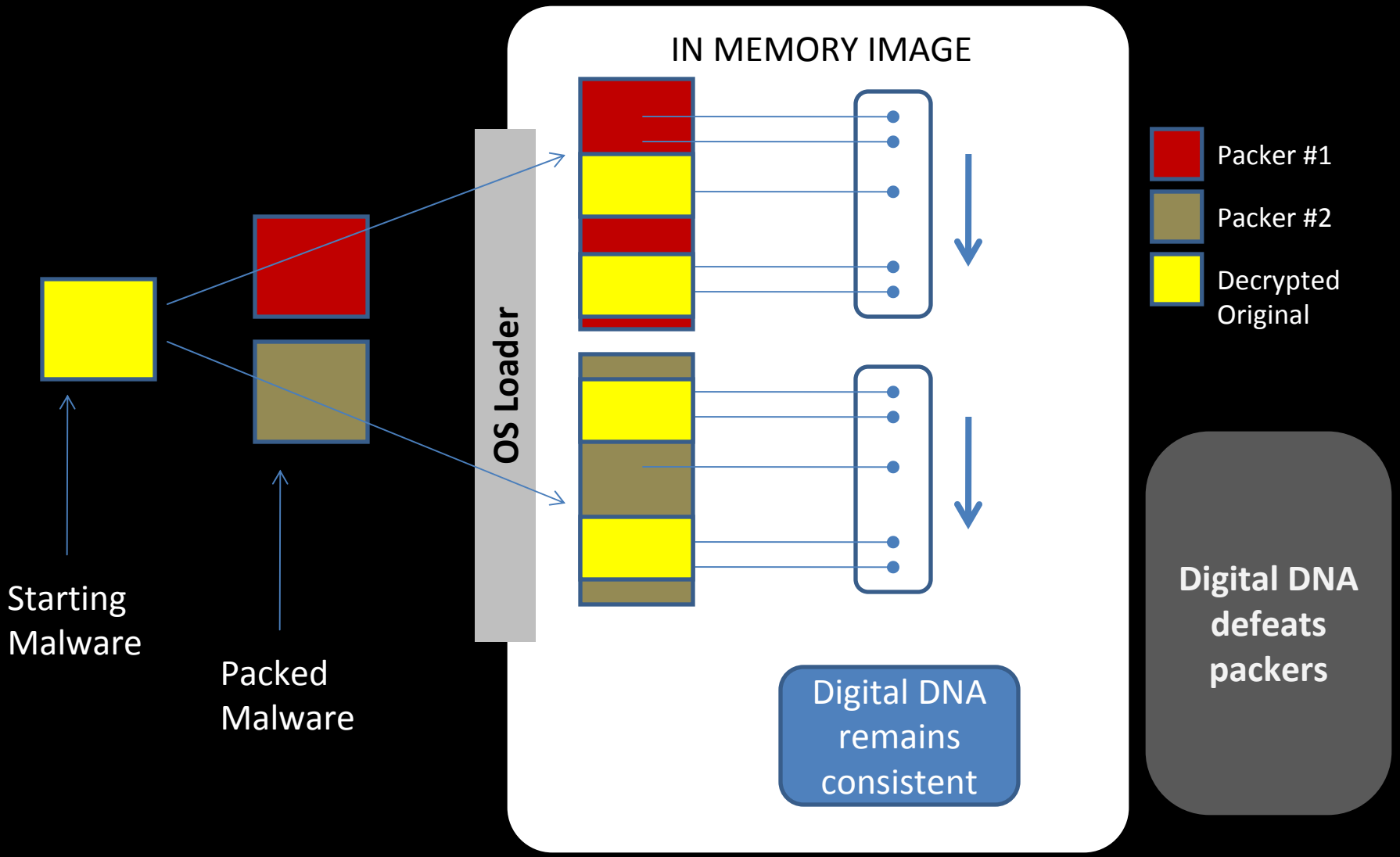
- A file executing in RAM is represented in a new way that cannot be easily be back referenced to a file checksum
- Digital DNA™ does not change, even if the underlying file does
  - Digital DNA is calculated from what the software DOES (it's behavior), not how it was compiled or packaged

State of malicious code




DISK FILE
IN MEMORY IMAGE
OS Loader
100% dynamic
Copied in full
Copied in part
In memory, traditional checksums don't work
MD5 Checksum reliable
MD5 Checksum is not consistent
Digital DNA remains consistent


DISK FILE
IN MEMORY IMAGE
Internet Document
PDF, Active X, Flash
Office Document, Video, etc…
OS Loader
Public Attack-kits have used memory-only injection for over 5 years
MD5 Checksum is white listed
Process is trusted
White-listing on disk doesn't prevent malware from being in memory
Whitelisted code does not mean secure code


IN MEMORY IMAGE
OS Loader
Packer #1
Packer #2
Decrypted Original
Starting Malware
Packed Malware
Digital DNA remains consistent
Digital DNA defeats packers