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## MLS Ecosystem Overview

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# Overview

- The CSCF program leverages data-centric MLS OS configurations for the last 20 years
  - Minimize hardware, licensing, OS configuration, manpower costs
  - Maximize flexibility, data fusion, system utilization
- MLS requires a full ecosystem to be truly useful
  - ~15 years to get a successful MLS aware parallel network file system
  - ~3 years to get a MLS aware resource manager
- Even without the MLS, the system has exceptional security due to the RHEL (SELinux integrated) Enforcement Mode
  - Role Based Access Controls (RBAC)
  - Auditing



# History

- CSCF has a long history (20+ years) with MLS:
  - Trusted UNICOS
  - Trusted IRIX
  - Trusted Solaris
  - Red Hat Enterprise Linux
- Historically, for HPC systems, a vendor provided a HPC solution:
  - Hardware
  - Firmware
  - Operating System
  - Compilers
  - Scientific Libraries



# History

- Current approach is a grocery store:
  - Hardware: Vendor A
  - Firmware: Vendor A (maybe)
  - OS: Vendor B
  - Compilers: Vendor C
  - Libraries: Vendor D (sometimes Vendor C has some and some open source)
- Entity purchasing system ends up responsible for making it all work
  - Serious room for big problems
  - CSCF benchmarked a new system, modified configuration, now running 25% faster than vendor benchmark system



# Current MLS RHEL Status

- CSCF has a government owned RHEL configuration
  - ICD 503 certified through a government agency
  - Integrated, certified additional MLS capable packages:
    - Resource management
    - Network file system
    - Direct attached file systems
    - MLS native IB for cluster & blade server type configurations
    - MLS Postgres database
    - Long haul IB
    - System monitoring and security audit reduction
    - Training modules commercially available
- Cray and SGI are fully working as MLS partners with Penguin, Aspen, and Dell getting involved
- DOE LANL and DOD HPCMO planning systems in the next 12 months



# MLS Partners

- LMC/CSCF/WF
- Red Hat
- Altair
- Seagate
- Mellanox
- Crunchy
- Splunk
- Filius/RPI/CSC
- SGI
- ViON
- Bay Microsystems
- Cray
- Penguin
- Aspen
- Dell



# CSCF Path Forward

- Configuration Management
  - SCAP through open source
    - OVAL will be added for mitigation
  - Subversion
    - Privileged User Guide (PUG)
    - Specialized scripting (if any after SCAP implementation)
- Configuration Objective
  - Provide MLS SCAP profile, SVN repositories, and PUG to allow easy, standard builds
    - Support vendor unclassified debugging of CSCF problems
    - Support new government interest in MLS to consolidate rather than duplicate
    - Support data fusion processing efforts

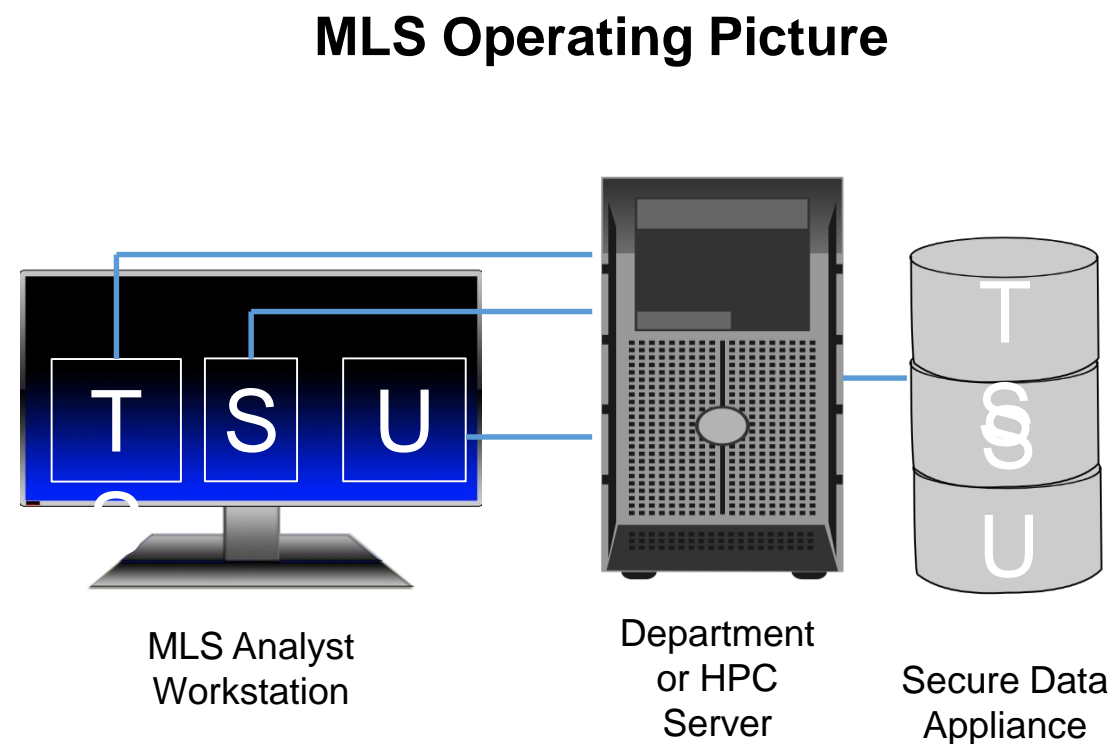
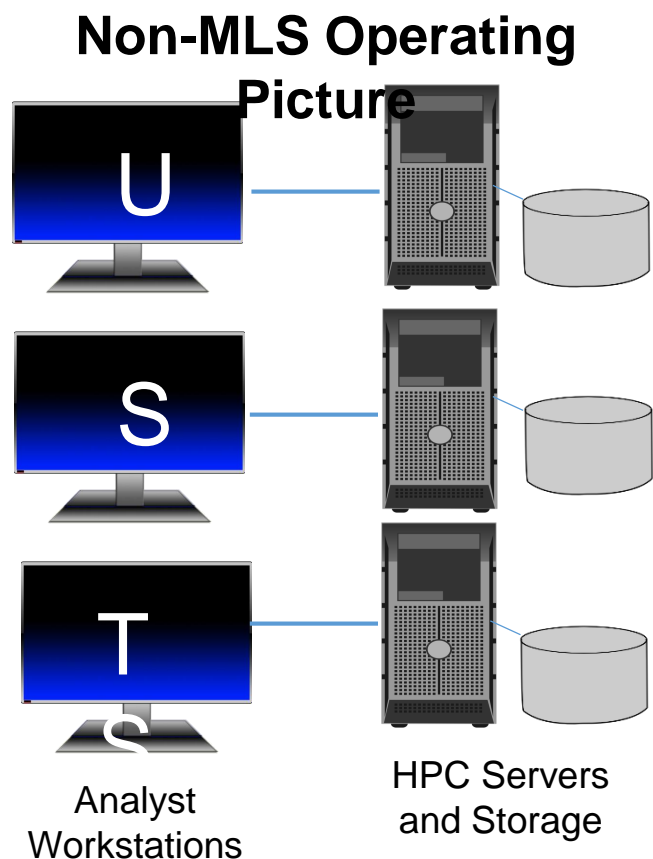




# CSCF Path Forward

- **MLS Ecosystem Objective**
  - Provide MLS capable version of software capabilities integrated with the MLS RHEL configuration to solve complex system configuration and support problems
    - Solves some budget issues
    - Enhances and enables data fusion
    - Enhances basic security profile

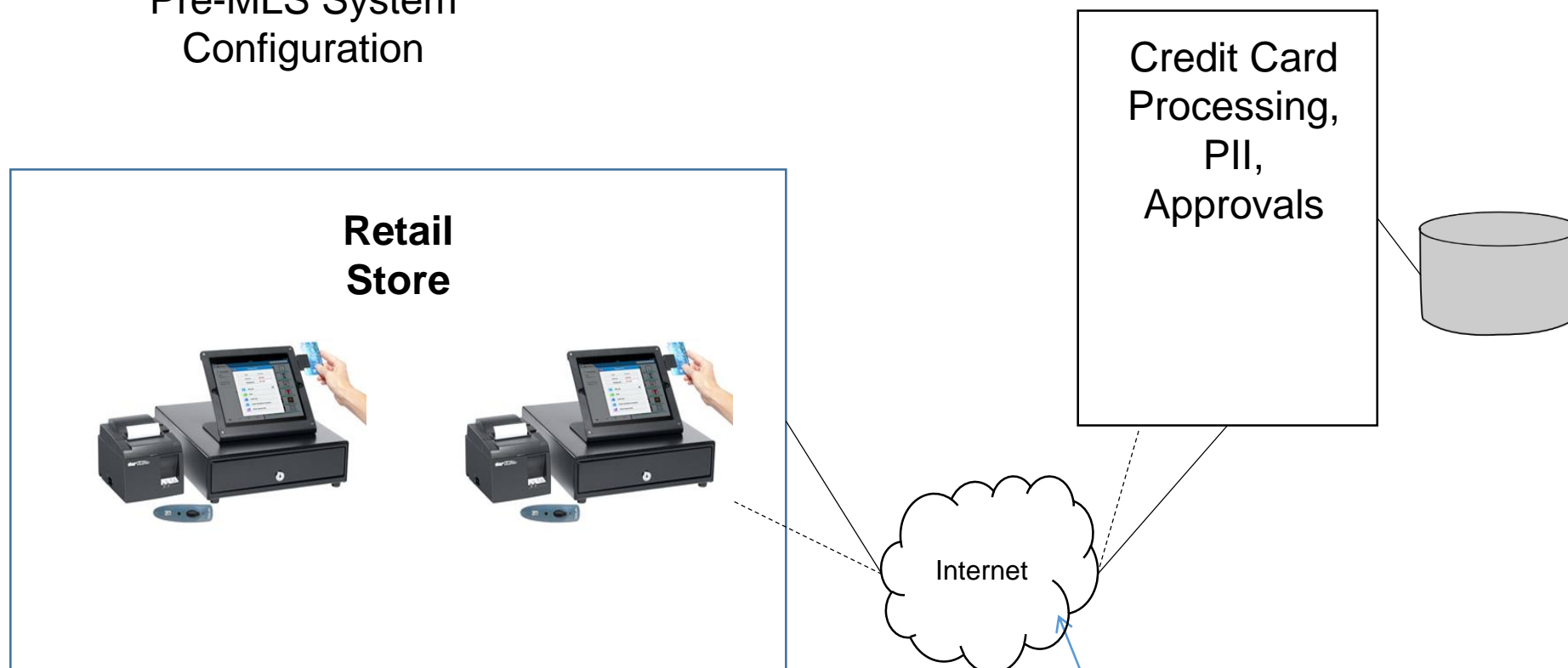
# Federal Use Case – Consolidation & Data Fusion



**Consolidates hardware and enables analyst driven data fusion**

# Commercial Use Case

## Pre-MLS System Configuration



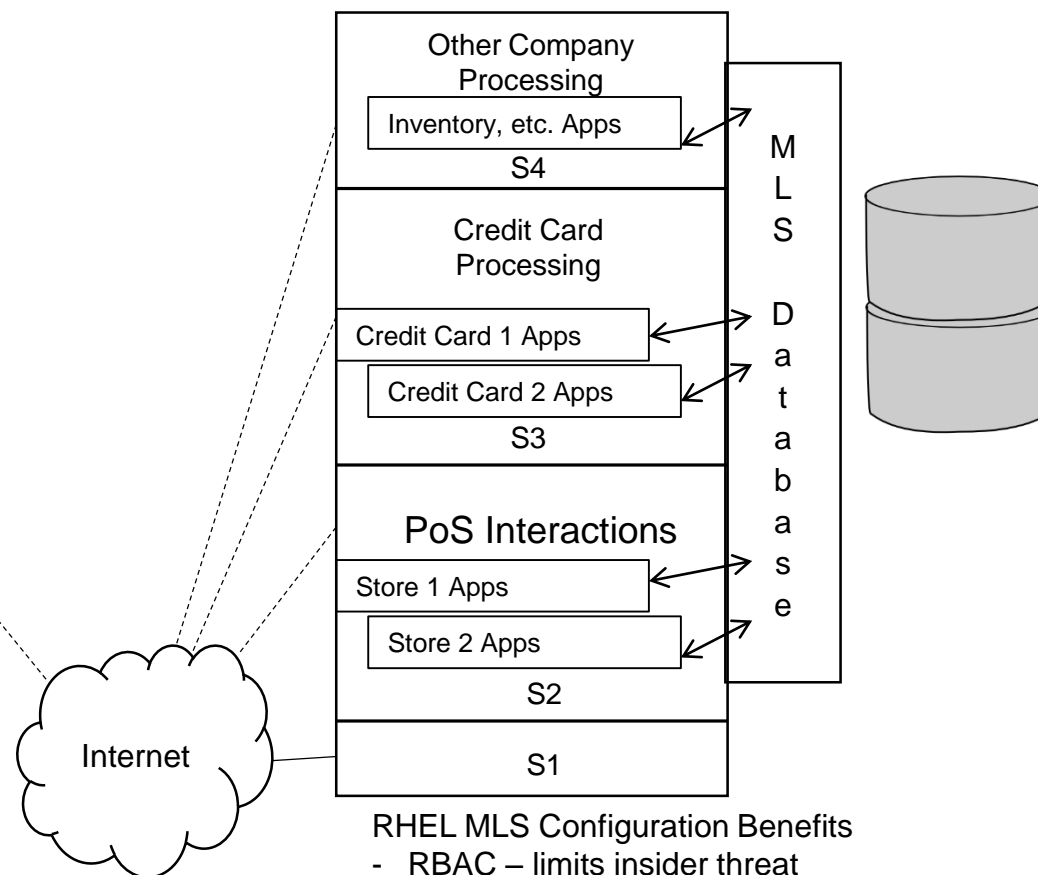
Network Access Table (assumes firewalls in place)

- Unencrypted -----
- Encrypted -----

"Bad Guy"  
Egress Point

# Commercial Use Case

## MLS System Configuration



Network Access Table (assumes firewalls in place)

- Unencrypted -----
- Encrypted -----

### RHEL MLS Configuration Benefits

- RBAC – limits insider threat
- MLS – isolates functions to limit damage
- Encryption – eliminates egress points for Trojans



# Tutorial Forward

- MLS Ecosystem Integrated
  - Individual MLS parts do not provide any real capability
  - Unintegrated individual MLS parts do not provide any real capability
  - Only fully integrated MLS parts built into the processing capabilities required by a customer actually make any sense
- Tutorial Parts
  - Sections will provide an insight into the MLS capabilities provided and the integration required to create the ecosystem