Case Study: Enhancing IBM Websphere with SELinux

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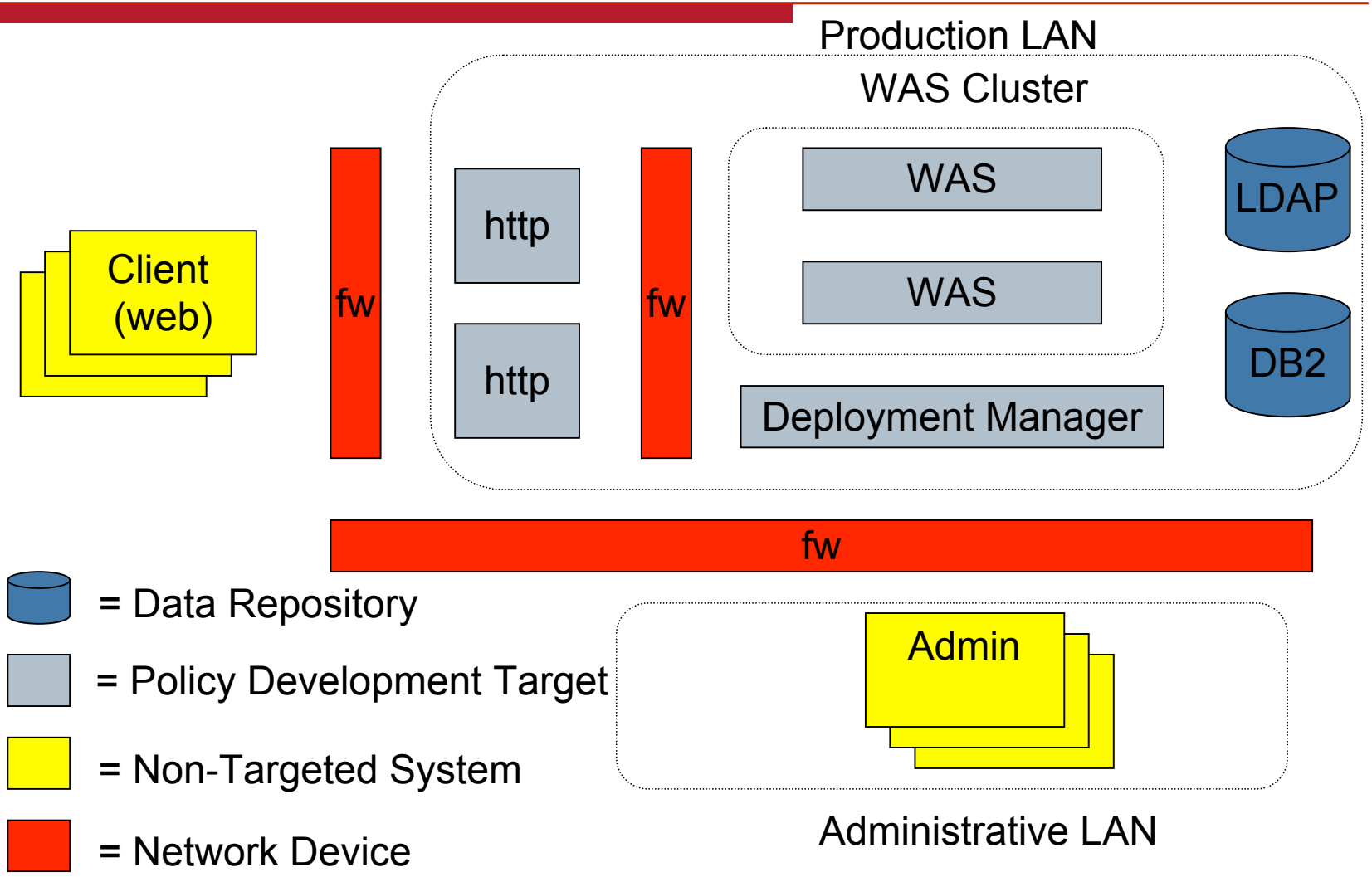
Project Overview

- Primary development targets
  - UK Government pilot program
    - demonstrate effectiveness of SELinux
    - meet security needs of UK Government
  - Create prototype IBM Websphere enhancement
    - explore adding SELinux to complex middleware
    - support wider configurations than pilot
- Timeline and status
  - Proof-of-concept / demo nearing completion
  - Initial prototype in development – complete 4/1
  - Pilot rollout planned for 5/1

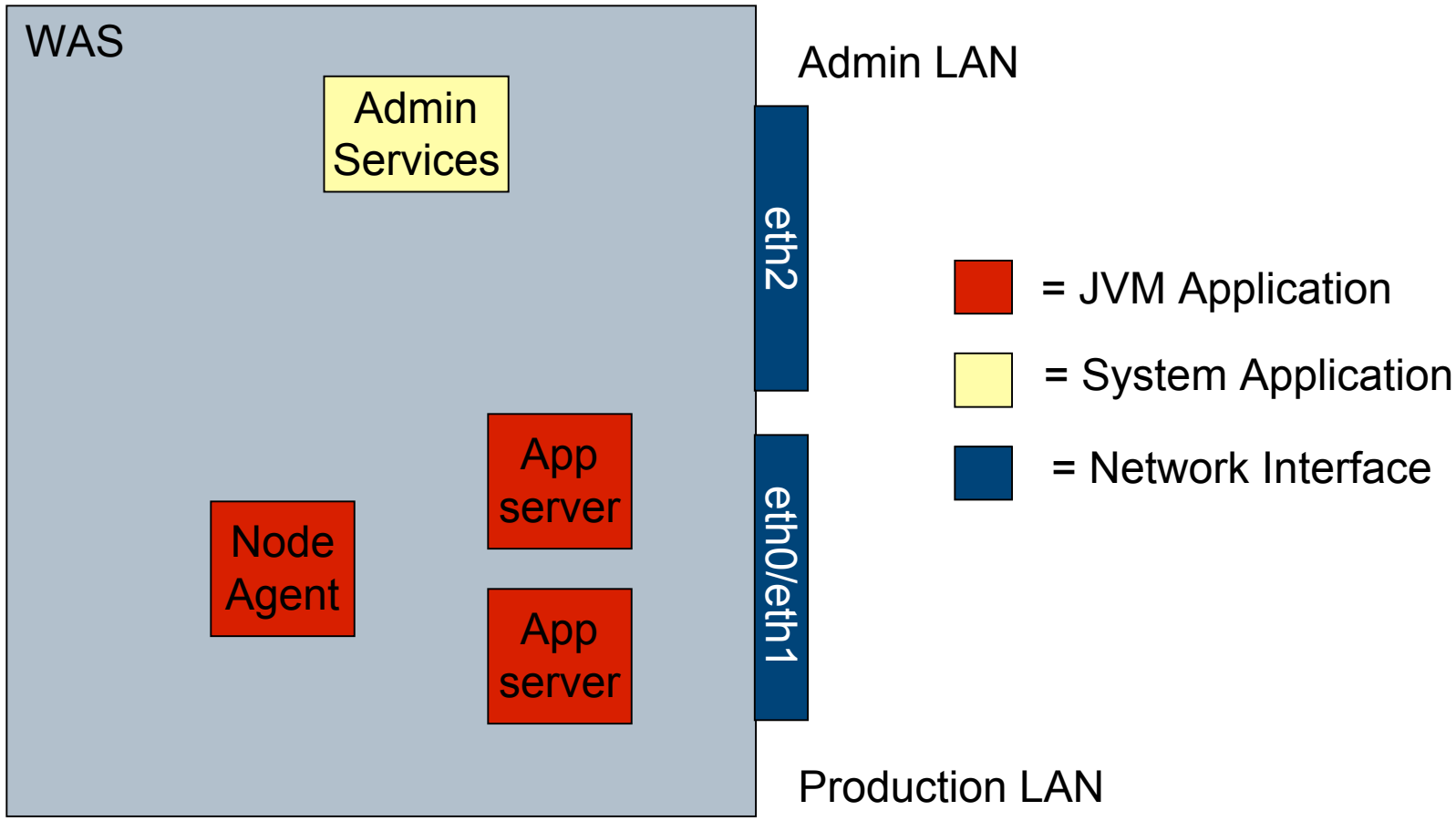
WebSphere Prototype Goals

- Enhance the security of WebSphere using SELinux
  - Server process confinement and protection (sandboxing)
  - Strongly enforce the N-tiered architecture
  - Fine-grained, configurable network security at the process level
- Security configuration familiar to a typical WebSphere admin
  - Requires no SELinux knowledge
  - Eventually integrated into standard Websphere admin tools
- Support typical WebSphere functionality
  - Following best-practices from IBM hardening guides
  - Better security without limited functionality
  - Ideally support features with scalable security
    - security features increase / decrease based on configuration

Pilot Targeted Configuration



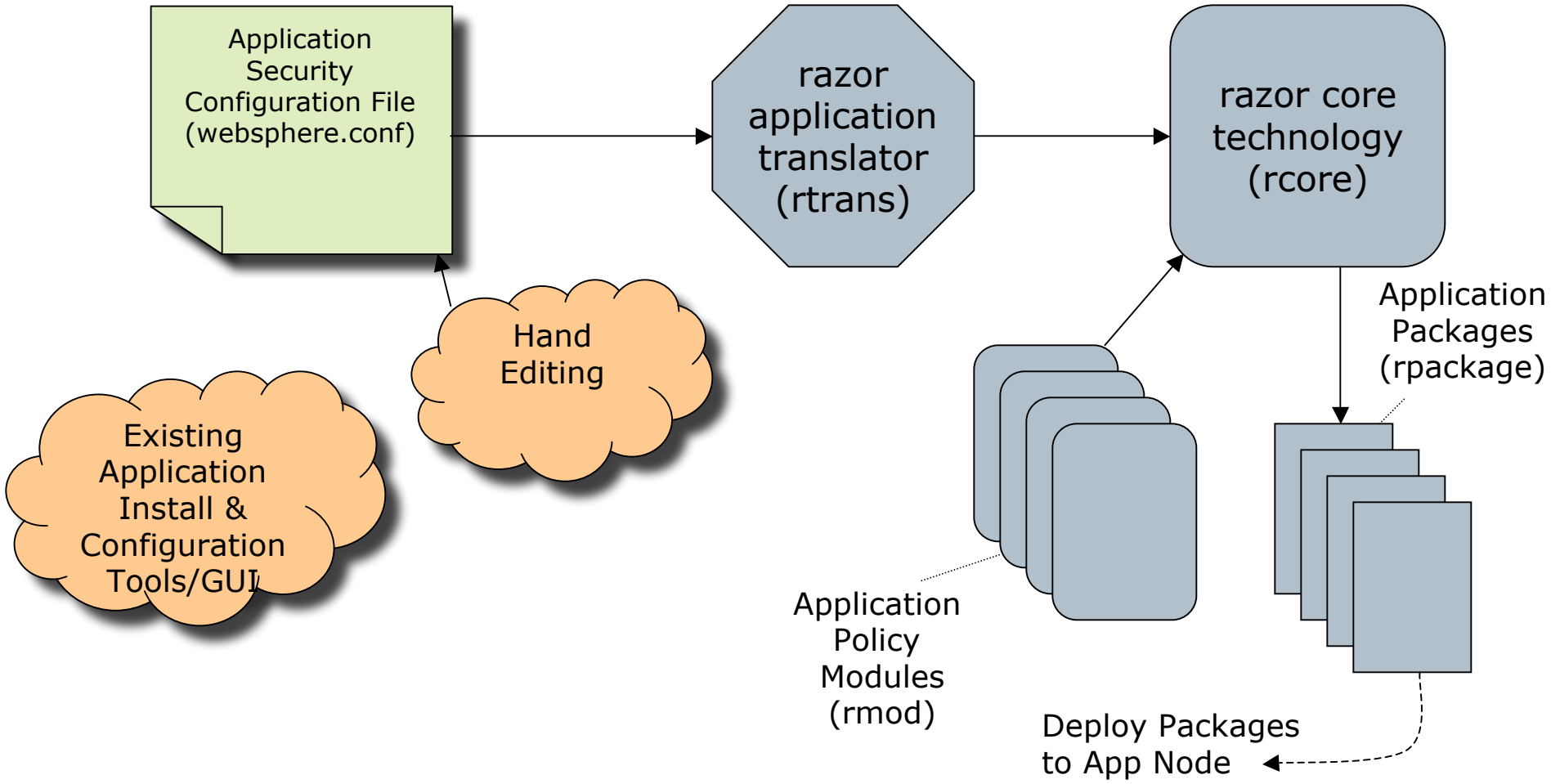
Websphere Application Server Architecture



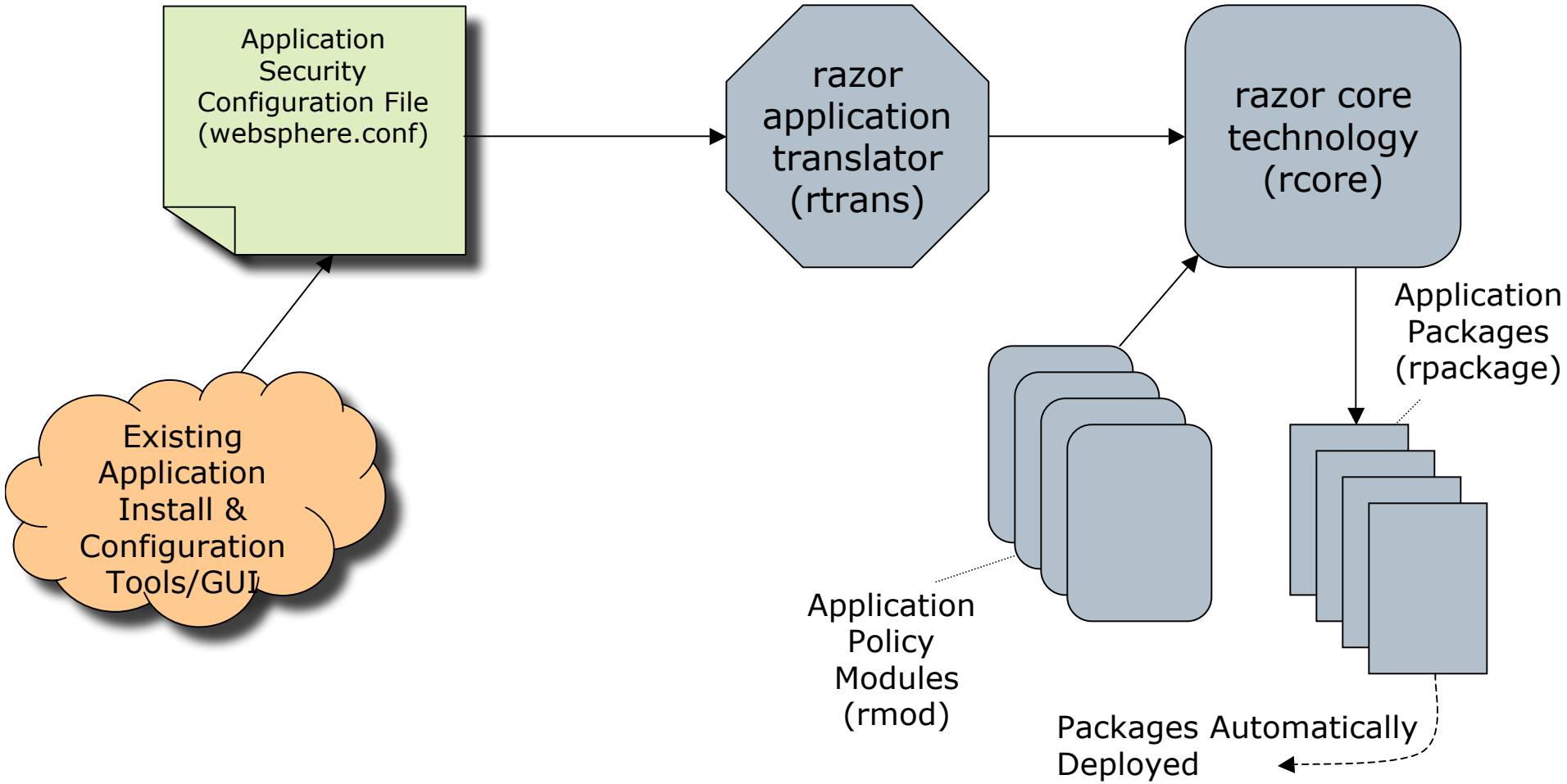
Challenges

- SELinux provides strong base
  - Provides process confinement and protection
  - Can tighten the network at the process level
- Current policies are rigid, inflexible
  - Take it or leave it for each target in the policy
  - Targets get broad networking permissions
- *Customization requires writing policy*
  - Even to make minor adjustments, e.g., ports
  - Potentially for dozens of systems
- Administration requires policy updates

WebSphere Prototype using “razor”



Future Functionality



Benefits

- Server process confinement and protection
  - Last line of defense in case of errors / exploits
  - Protect Websphere from other services
- Provide flexible, process level network control
- Strongly enforce N-tier architecture
  - Supports the Websphere security model
- Enable server consolidation
  - Multiple application servers per system
  - Safely accessing backend data of different sensitivity
- All the benefits of SELinux
  - Specifically tailored for each deployment
  - Without detailed SELinux knowledge required

QUESTIONS?

Backup

Pilot Supported Features

- Multiple IBM HTTP Servers
- WebSphere Application Server Network Deployment
  - Single WAS cluster
    - multiple nodes
    - multiple app servers per node
  - Deployment Manager
- Practically any backend services
  - DB2 (app data and session), IBM Directory Services, etc
  - Access is allowed based on IP address, port, netif
- General administrative services (Tivoli, etc)