

U. S. Railroad Retirement Board



Platform Domain Architecture

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Platform Domain Definition

The Platform domain defines technologies, equipment, standards, operating guidelines and policies for laptops, desktops, mainframe, peripheral, servers, software, services in order to meet the technical and business requirements of the user community.

Domain Technology Categories

- Operating Systems
- Enterprise Storage
- Mainframe Hardware
- Mainframe Software
- Desktop Hardware
- Desktop Software
- Server Hardware
- Server Software

Platform Domain Principles Summary

1. Use industry-standards
2. Consolidate hardware and software
3. Use a centralized, up-to-date asset management system
4. Establish and adhere to reuse standards
5. Promote the procurement of reusable assets
6. Maintain the evolving capability of transacting with other external business partners and customers
7. Establish, formalize, and maintain contacts with business partners and customers
8. Identify and periodically project the potential changes in requirements based on historical trends, actual and future business needs
9. Ensure adherence to the enterprise architecture principles through design, documentation, and project reviews
10. Identify, follow, and evaluate on an ongoing basis new platform technologies and platform-impacting technologies
11. Reduce total cost of platform assets

Domain Relevant Trends

- Speed is increasing
- Mobility is increasing
- Decentralization of workforce
- Increase of business partners and customers
- Increased ease of use
- Increased availability / variety
- Open standards
- Interoperability
- Decreasing prices / Moore's Law

Internet Related

- Increased volume of transactions
- Increased availability 24/7
- Reduction in process cycle time
- Reduction in the number of hand-off's
- Dehumanization

Background of Platform and Related Technologies at the RRB

The agency began operating in a mainframe computer environment during the 1960s utilizing standard IBM operating systems. Application systems were written in various programming languages to execute in a batch environment on various pieces of equipment. All computer systems and related devices were housed in a data center with no technological capability of online or remote access to data or systems. The mainframe hardware and software was utilized and controlled by one organization in the agency.

Over the years the technologies incorporated at the board have included capabilities of other platforms such as PCs, desktop software, LAN/WAN, remote access, mobile access and facilities that have led to a disbursement of information technology capabilities throughout the agency. In 1986 desktop PCs were introduced and by 1989 they were creating batch jobs for mainframe processing. In 1993 LAN technology was introduced leading to a Virtual LAN in 1997. By 1999, all district office connectivity was converted to a frame relay system.

Hardware and software now exists, to some degree or other, on nearly every work station in the agency. Additionally, advanced communications technology has been incorporated to allow access from the field service (both field offices and itinerant service), business partners, and customers.

While the processing of data on a large scale and the check-writing operations of the agency are still performed on the mainframe system, much of the claims adjudication, administration, and communications/email activity is done on the other platforms. All bureaus and offices are now equipped to perform many of their functions in an automated fashion that leads to a more efficient operation. These advancements have allowed the board to greatly improve its services to our business partners and customers.

To advance further the board has recently undertaken new initiatives such as mobile access and enhanced use of the Internet. These are areas that will lead to improved customer service, lower costs, and further the concept of one-and-done for our beneficiaries.

Detailed Domain Principles

Domain Principle 1

Use Industry Standards

Rationale:

- Proven, stable, reliable, easily available
- Allows effective communication with outside entities
- Portable across platforms
- Allow interoperability
- Enhance adaptability
- Increase longevity
- Adheres to open standards

Implications:

- Increased ease and availability of support
- Increased productivity
- Avoid bleeding edge and allow leading edge
- Reduced product market
- Reduced administration time (product interfaces already exist, do not need to be created in-house)
- Improved information exchange (business partner data exchange simplified)

Domain Principle 2

Consolidate Hardware and Software

Rationale:

- Reduce cost of operation
- Optimize data transfer (reduce bottlenecks)
- Increase efficiency of processes

Implications:

- Achieve cost efficiency (need for fewer components)
- Reduced downtime/frequency of outages
- Increased impact of outages

Domain Principle 3

Use a centralized, up-to-date asset management system

Rationale:

- Identify current assets
- Identify future needs

Implications:

- Better management of assets
- Reduce unnecessary acquisitions
- Modify current asset management system for future needs
- Consolidate the current asset management systems into a centralized system

Domain Principle 4

Establish and adhere to reuse standards

Rationale:

- Required by law
- Set limits of reuse to eliminate risk of use beyond life expectancy

Implications:

- Reduce risk of data loss
- Comply with the law
- Reduce maintenance cost of outdated assets

Domain Principle 5

Promote the procurement of reusable assets

Rationale:

- Prevent waste
- Avoid unnecessary expenditures

Implications:

- Improved decision-making process
- Redistribution of funds
- Reduce procurements

Domain Principle 6

Maintain the evolving capability of transacting business with partners and customers

Rationale:

Sustain and improve business

Satisfy customer expectations

Implications:

Provide improved service to business partners and customers

Better relationships with business partners and customers

Stay current with business partners' and customers' technology

Domain Principle 7

Establish, formalize, and maintain contacts with business partners and customers

Rationale:

Stay current with business partners' and customers' needs

Implications:

Purchase or maintain technology that may be used solely for communication with business partners and customers

Include business partners and customers' requirements in the planning and implementation

Process

Domain Principle 8

Identify and periodically project the potential changes in requirements based on historical trends, actual and future business needs

Rationale:

Accommodate changing business needs

Improve performance

Implications:

Improved budget forecasting

Support changing business needs faster

Better response time

Faster throughput

Additional staff required for analysis

Requires better forecasting of business needs

Mandate the procurement of extensible and scalable equipment

Domain Principle 9

Ensure adherence to the enterprise architecture principles through design, documentation, and project reviews

Rationale:

Compliance with agency guidelines

Consistency of projects across the organization

Implications:

Our domain principles must be included in RFP's

Approval of projects is subject to compliance

Formal review process must be established

Domain Principle 10

Identify, follow, and evaluate on an ongoing basis new platform technologies and platform-impacting technologies

Rationale:

- Stay in business
- Mitigate business and technical risks
- Provide better customer service
- Provide new capabilities and efficiencies

Implications:

- Increased costs
- Increased risk (performance level degradation)
- Increased satisfaction level
- Increased scalability and extensibility

Domain Principle 11

Reduce total cost of platform assets

Rationale:

- Directed by OMB
- Reduce spending
- Optimize existing assets

Implications:

- Possible increase in initial cost
- Identify and quantify total cost of ownership
- Manage inventory better
- Using competition
- Volume discount
- Requires strategic scheduling of purchases
- Consolidation of existing assets
- Buy efficient technologies (not cheap)
- Replace/substitute existing technologies

Platform Preferred Domain Design Patterns

Pattern 1

Move from multiple storage architectures toward a single repository of mainframe/LAN storage

Purpose

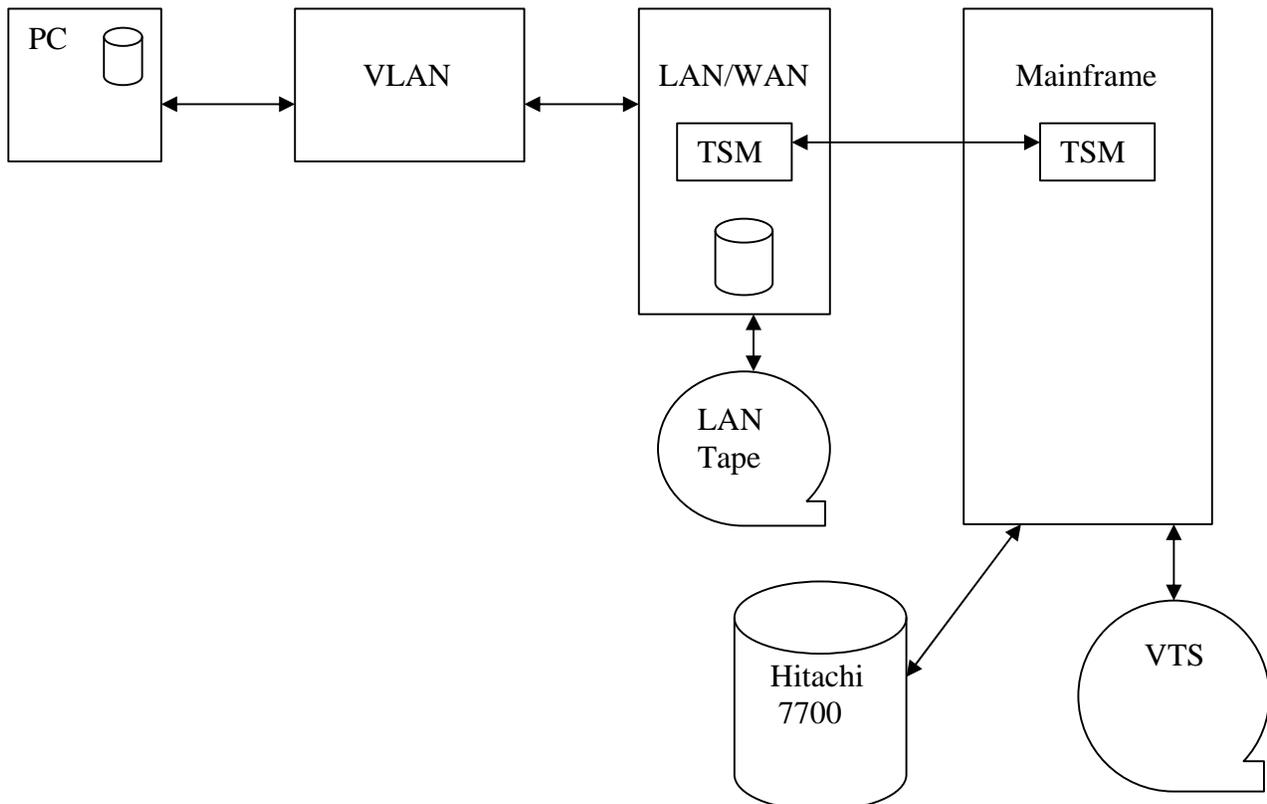
- Share data
- Reduce cost
- Improve data integrity
- Improve backup and recovery capabilities
- Reduce data redundancy

Applicability

- Pattern can be applied throughout the agency where data needs to be stored
- When acquiring new storage technologies

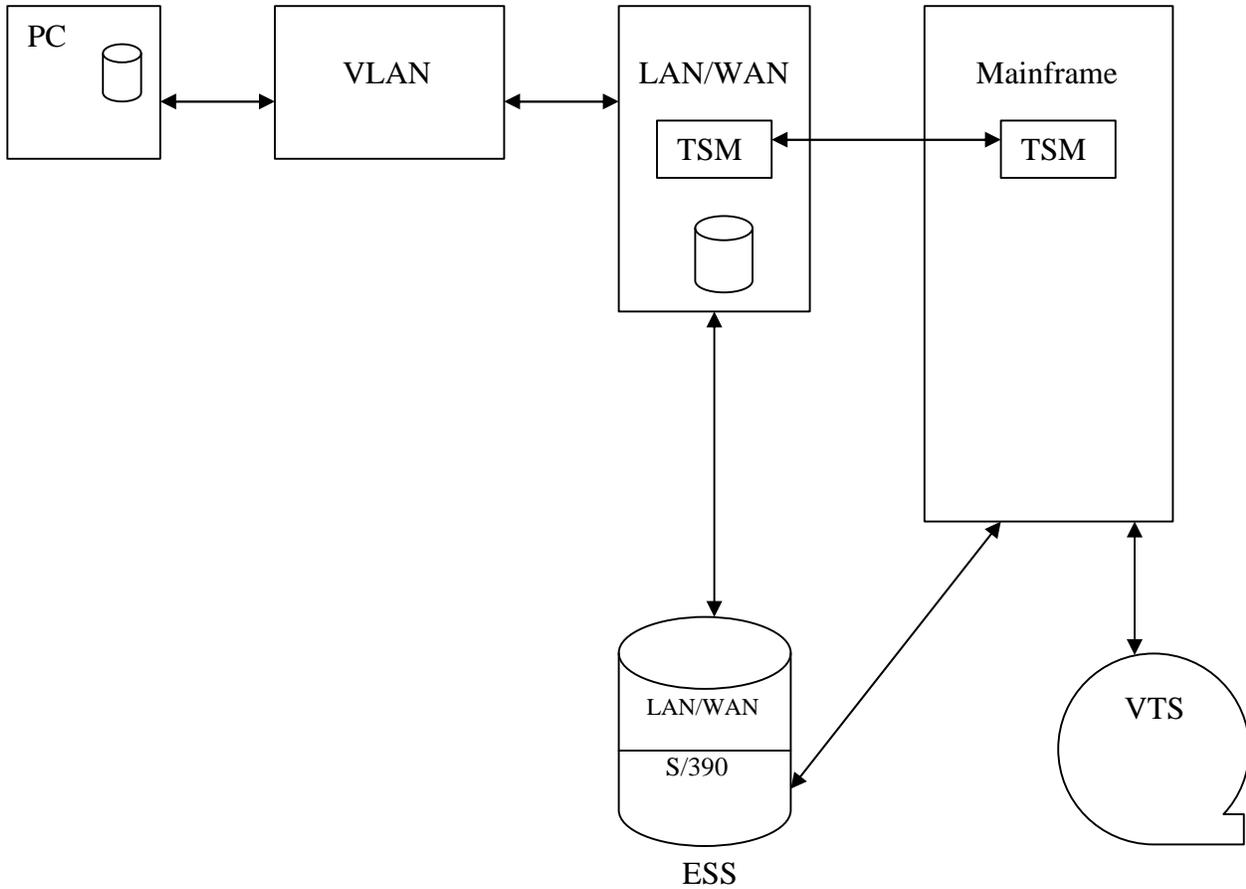
Structure Overview

Before Enterprise Storage Server (ESS) (routers, hubs, the multiple LAN/WANs and PCs, etc are not shown for simplicity):



Pattern 1 continued:

After Enterprise Storage Server (ESS) (routers, hubs, the multiple LAN/WANs and PCs, etc are not shown for simplicity):



- ESS Enterprise Storage Server
- TSM Tivoli Storage Manager
- S/390 System 390 (Mainframe)
- VTS Virtual Tape Server
- VLAN Virtual LAN

Pattern 1 continued:

Assumptions

- Funding is available
- Reduce integration complexity
- Functionality can be furnished by technology available in the marketplace
- Availability of training

Benefits

- Share data
 - Easier access
 - Multiple platform availability
 - Reduce data redundancy
- Reduce cost of operation and ownership
 - Fewer devices required
 - Fewer software licenses
 - Smaller footprint
- Improve backup and recovery capabilities
- Improved customer service
- Improved security

Consequences

- Increased cost for storage technologies
- Increased impact of device outages

Related Patterns

- Pattern 2

Known Uses

- Mainframe and LAN utilize RAID 5 storage architecture
- LAN backups being routed to mainframe

Pattern 2

Combine separate and disparate systems and services into a unified enterprise-wide infrastructure

Purpose

Move from multiple protocols toward a single protocol to more efficiently use bandwidth

Move from multiple, incompatible printing sources to enterprise print services allowing printing from any application to any location

Move from distributed control systems toward a centralized control system allowing for improved administration including load balancing, resource management, data sharing in memory, and inter-region communication

Pattern 2 continued:

Applicability

Pattern can be applied throughout the agency and to business partners and customers

Assumptions

Functionality can be furnished by technology available in the marketplace
Availability of training
Additional staffing required
Availability of funding

Benefits

Improved response time
Reduction in support costs
Reduction in machine cycles and power consumption
Increase in throughput
Reduction in staff administration time
Availability of mobile printing
Enhances the "one-and-done" concept

Consequences

Migration efforts required
Increased impact of service outages

Related Patterns

Pattern 1
Pattern 3

Known Uses

Implemented TCP/IP
FTP
Mainframe printing from remote locations
Terminal sessions
Consolidated server-associated storage

Pattern 3

Transition toward increased remote and mobile access to resources

Purpose

- Support the agency's work-at-home initiative to comply with OMB regulations
- Provide remote access for field itinerant service
- Improve data collection and processing
- Improve customer service

Applicability

- All employees in work-at-home environment
- Field service employees
- Business partners and customers
- Employees in travel status

Assumptions

- Increased bandwidth required
- Availability of appropriate support
- Necessary funding available
- Field service employees and employees in travel status will have appropriate configurations provided
- Work-at-home employees, business partners, and customers will need to furnish their own equipment

Benefits

- Lower environmental costs
- Better service provided to customers by field service employees and hearings and appeals officials
- Improved disaster recovery capabilities in field offices
- Ability to maintain customer service during field office moves

Consequences

- Increase in support costs
- Security implications
- Additional training
- Additional funding

Related Patterns

- Pattern 2

Known Uses

- Accommodated employees
- Provided laptops to field service

Domain Participants

Domain Team Leader: Eileen Leiderman (Alternate: Cilla Esiri-Olowopopo)

Line of Business Representatives: Ronald Russo, Daniel Fadden, Thomas Kolavo

Domain Participants: Richard Bertone, Robert Miller, Joseph Onchak, Andrew Howell

APG Representative: Judy Lombardo

Appendix 1: Domain Glossary

Term	Definition
Control System	Collection of utilities used to manage system functions
Enterprise	Agency-wide
Footprint	Area occupied by a hardware component
FTP	File Transfer Protocol
Hand-off	Passing a transaction from one process, or person, to another
Moore's Law	The term was coined after a co-founder of Intel. It states that the number of transistors (or the amount of memory) that can be placed on a chip doubles every 18 months. It was a prediction more than a "law" in the sense that a scientist would use it; the usage is tongue-in-cheek in the vein of Murphy's Law. Semiconductor manufacturers actually take this prediction quite seriously and use it for forecasting the type of technology that will be available. Most industry analysts, and Moore himself, expect his prediction to hold true for at least another two decades.
"One-and-done"	Concept of handling a customer's transaction in one contact
Reusable Assets	Concept of purchasing and using assets for multiple purposes based on the product's lifecycle and its suitability to the enterprise needs rather than acquiring and disposing of an asset based on a "single use" requirement.

Appendix 2: Conceptual to Domain Principle Matrix

		<i>Relationship Between RRB's Domain Principles And Conceptual Architecture Principles</i>																								
<i>Domain Principle</i>	<i>Conceptual Architecture Principles</i>																									
	C A 1	C A 2	C A 3	C A 4	C A 5	C A 6	C A 7	C A 8	C A 9	C A 10	C A 11	C A 12	C A 13	C A 14	C A 15	C A 16	C A 17	C A 18	C A 19	C A 20	C A 21	C A 22	C A 23	C A 24	C A 25	
D-1	X				X	X										X	X			X	X	X	X			
D-2					X										X					X						
D-3													X				X									
D-4													X													
D-5	X												X													
D-6																					X				X	
D-7																					X					
D-8	X	X	X										X													
D-9					X	X						X			X	X										
D-10				X		X								X												
D-11					X	X									X	X	X								X	

Conceptual Architecture Guiding Principles:
 1. Use guidelines consistent with the Federal Enterprise Architecture. 2. Support a single Enterprise Wide Technical Architecture (EWTA). 3. IT projects are to be consistent with the Enterprise Architecture. 4. Business processes drive technical architectures. 5. Reduce integration complexity. 6. Technical architecture must be extensible and scalable. 7. Manage information and data as enterprise-wide assets. 8. Validate information as close to its source as possible. 9. Enhance the ability to capitalize on and exploit business information. 10. Support multiple data types. 11. Make an informed buy versus lease versus build decision before proceeding with any new development project. 12. Require shorter development cycle times. 13. Keep current with emerging technologies and their applicability to enterprise architecture. 14. Maximize infrastructure asset reuse. 15. Sustain reliable connectivity. 16. IT systems will be implemented in adherence with the agency's security, confidentiality and privacy policies. 17. The agency will use a consistent set of security interfaces and procedures. 18. Reduce total cost of operation (TCO). 19. Extend E-Mail to Become a Corporate Information Exchange Vehicle. 20. Adopt Open Systems Standards. 21. Reduce duplicate information systems. 22. Consider impact on business partners. 23. Maximize and exploit Internet and Intranet technologies and approaches. 24. Integrate Enterprise Architecture into the investment management process. 25. Customer perception is a measure of the quality of the automation processes.