

# Enabling Anycast

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Army-Contract MOIE

The logo for the MITRE Technology Program, featuring a stylized graphic of stacked blocks in yellow, orange, and blue to the left of the text.

**MITRE**  
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# Problem

- **Army tactical server mobility challenges include the requirement for static IP addressing.**
- **A client's server selection is not based upon the server's operational state or network state and performance.**
- **To enforce static IP addressing, the Army maintains mobility support via a “router per vehicle” concept that increases**
  - **Cost**
  - **Configuration requirements.**

# Background

- Today, Army TOC server location is preplanned and static.
- By 2004, the Army plans to deploy Service Location Protocol (SLP).
  - Standard does not correlate service discovery with server state or network performance based upon client's location.
  - User, service, and directory agent software each require coordinated configuration and extensive evaluation.
- Enabling plug and play anycast allows a simple architecture.
  - Anycast can be used to enhance the client's ability to locate the SLP directory agent.

# Objective

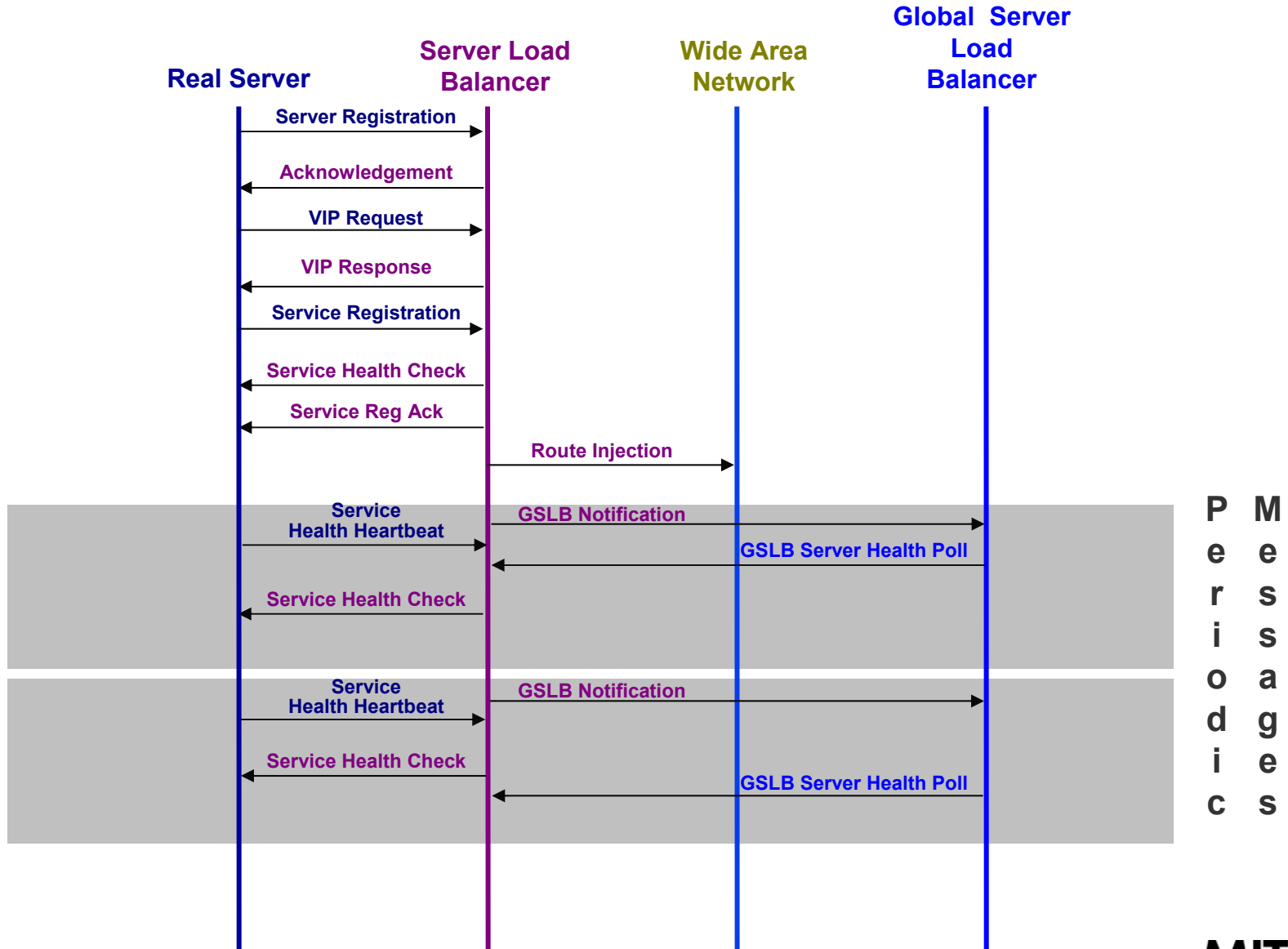
- **Enhance current Internet technologies to provide network centric server selection for the tactical environment**
  - Plug and play Server Load Balancing (SLB) with static preplanned Virtual IP (VIP) addresses or dynamically assigned VIP addresses
  - Global Server Load Balancing (GSLB) algorithms that account for unique tactical environments and networks
  - Employ new commercial technologies
- **Leverage anycast to support server mobility and server location**
  - Implement techniques that permit plug and play systems that are easy to plan, manage, deploy and use
  - Leverage open source software to engineer server mobility via “plug and play” functionality
  - Provide resilience, simplicity, and scalability

# Activities

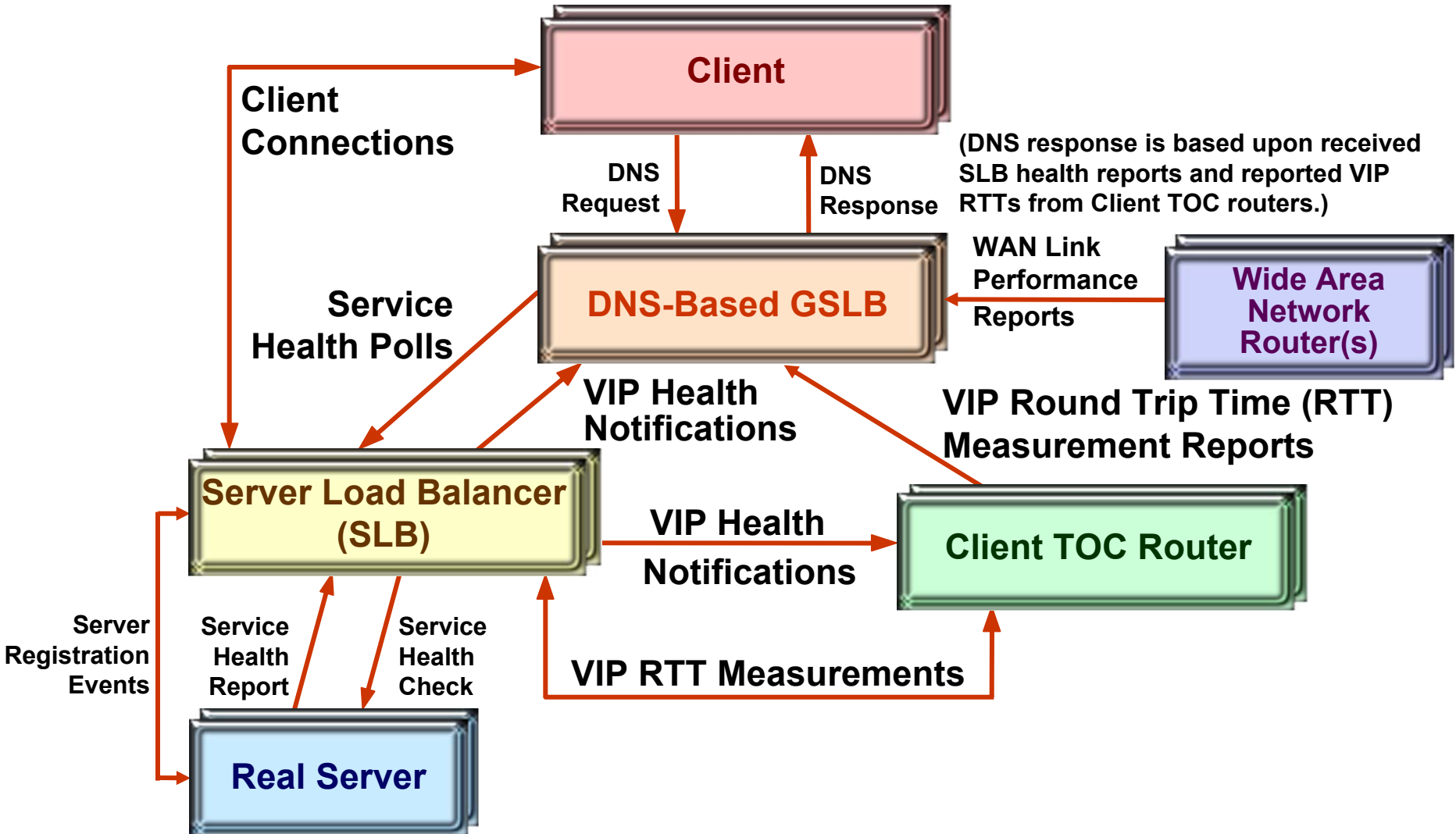
- Integrate open source software and commercial products to engineer plug and play server mobility
  - Local SLB with
    - Linux Virtual Server (LVS)/Java-enabled Cisco Internetwork Operating System\* (IOS)
    - IP routing support via Zebra or Cisco IOS
    - GSLB via Load Balanced Named (LBNamed)
- Demonstrate implementations on PC-104 devices
- Evaluate SLB support through 802.11 wireless

\* This is a pre-production version of Cisco IOS with an embedded Java Virtual Machine  
This Cisco IOS is currently not available on any basis for commercial use, however,  
Cisco is willing to discuss access to pre-release IOS images for research and experimentation

# Highlight



# Highlight/Demonstration



# Impacts

- **Potential impact on sponsored projects:**
  - **Next generation ABCS, Future Combat System, Army Knowledge Management**
- **Potential impact on IETF research groups such as Zero Configuration or Anycast/Multicast Working groups**
- **Transition SLB management client/server software to open source community**
- **Provide GSLB anycast solution for possible integration into tactical DNS implementation**

# Future Plans

- Integrate plug and play SLB Java client software on existing ABCS TOC server and next generation ABCS prototype software
- Integrate with robotic mobile networks
- Migrate software to support IPv6 and evaluate
- Provide Internet draft describing the server load balancing registration and management software
- Publish paper describing SLB and GSLB work completed to date