

HAIPE Augmentation, Routing and Integration Technology Concepts

Glen Nakamoto

781-271-3032 • nakamoto@mitre.org

William Sax

703-983-7670 • wsax@mitre.org

Army-Contract MOIE

**MITRE
Technology
Program**

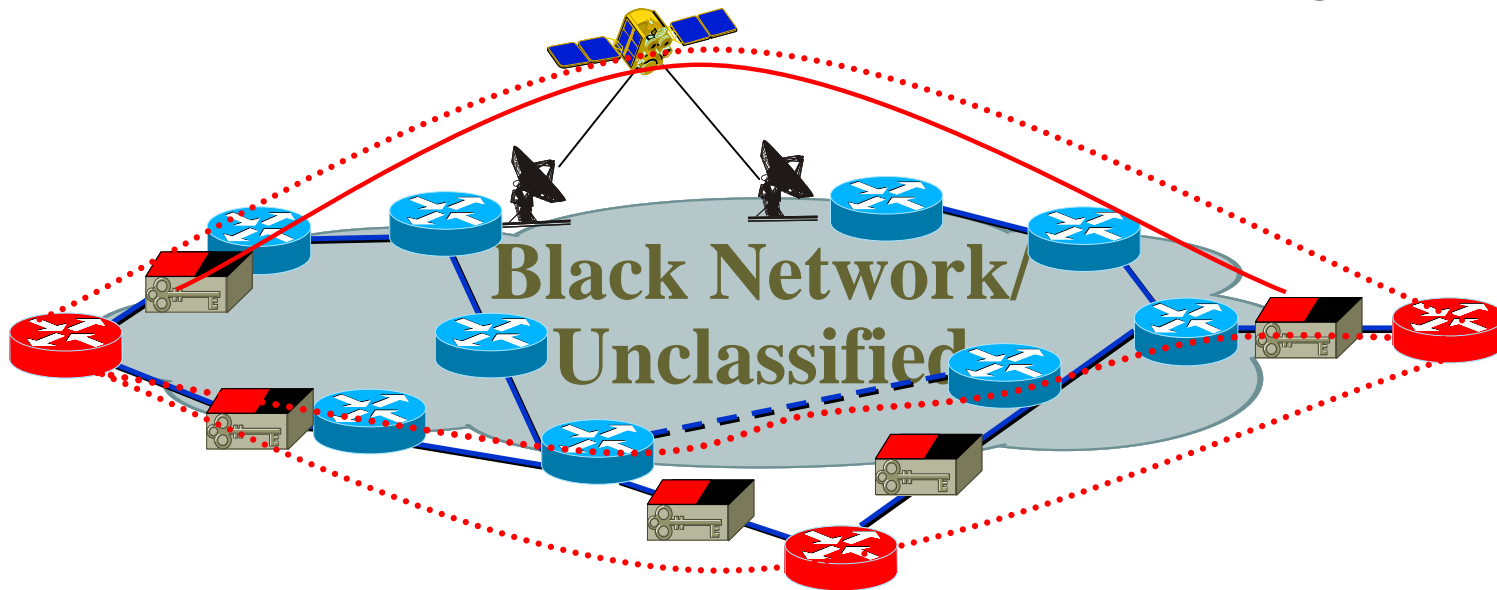
Problem

- **IP encryption changes the requirements for the routing environment**
 - **Additional research is required to develop a routing architecture to support the vision of Net-Centricity**
 - **Tactical networks require scalable, easy to deploy dynamic routing architectures**
- **Current discovery protocols for IP encryption will not scale to support the vision of the Global Information Grid**

Background

IP encryption use is growing and major programs (e.g., GIG-BE) are going to rely on IP encryption

The challenge is to make the IP encryptor simpler to deploy and easier to integrate



IP encryption is critical to future GIG

MITRE

© 2005, The MITRE Corporation

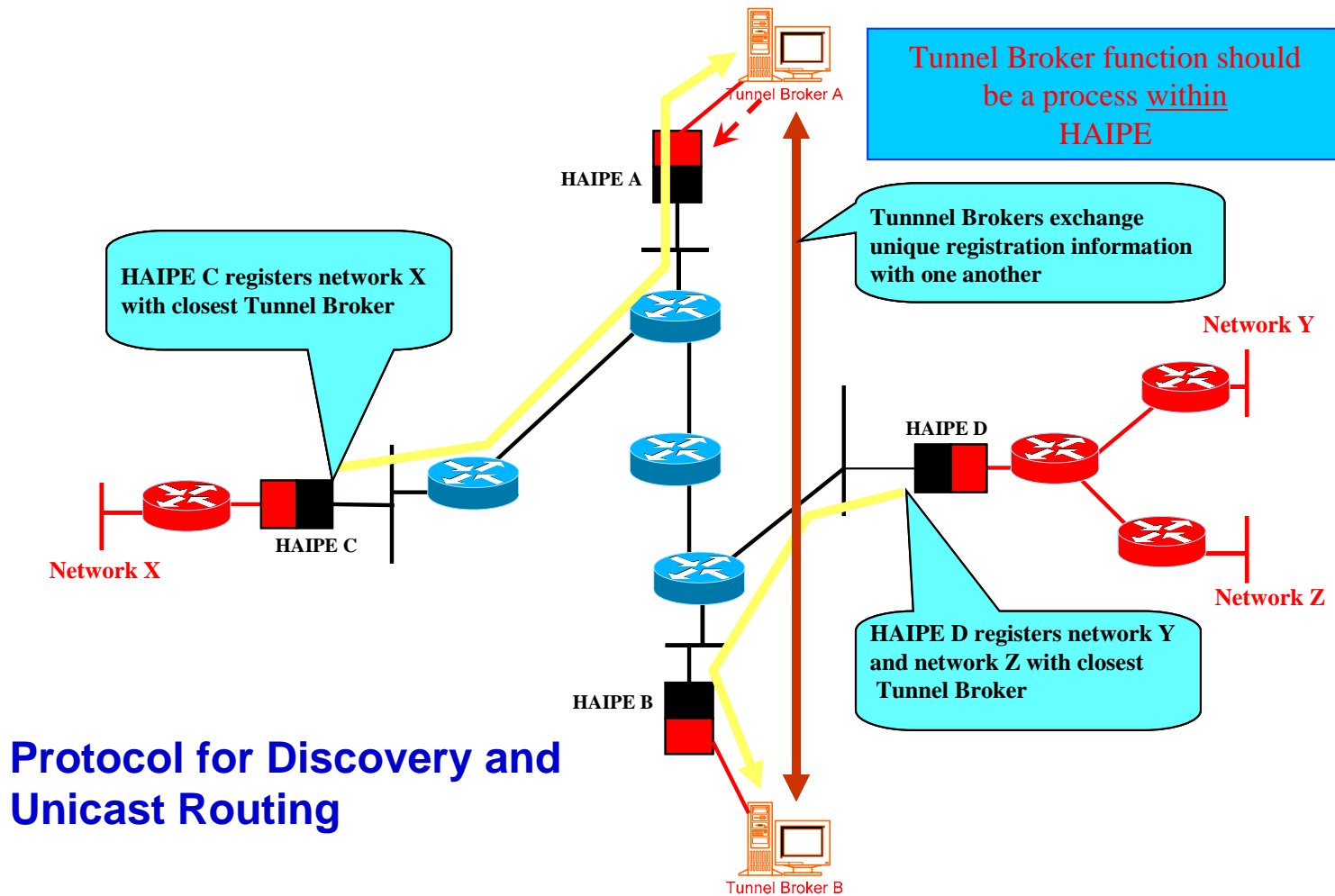
Objective

- To support the development of a scalable protocol that simplifies prefix discovery
- Research issues that may influence the HAIPE interoperability specification
 - A tunnel broker protocol (a.k.a., discovery)
 - End-to-end routing information
- Demonstrate essential modifications to the HAIPE and/or routing protocols that allow these devices to remain secure--and optimize routing in tactical networks

Activities

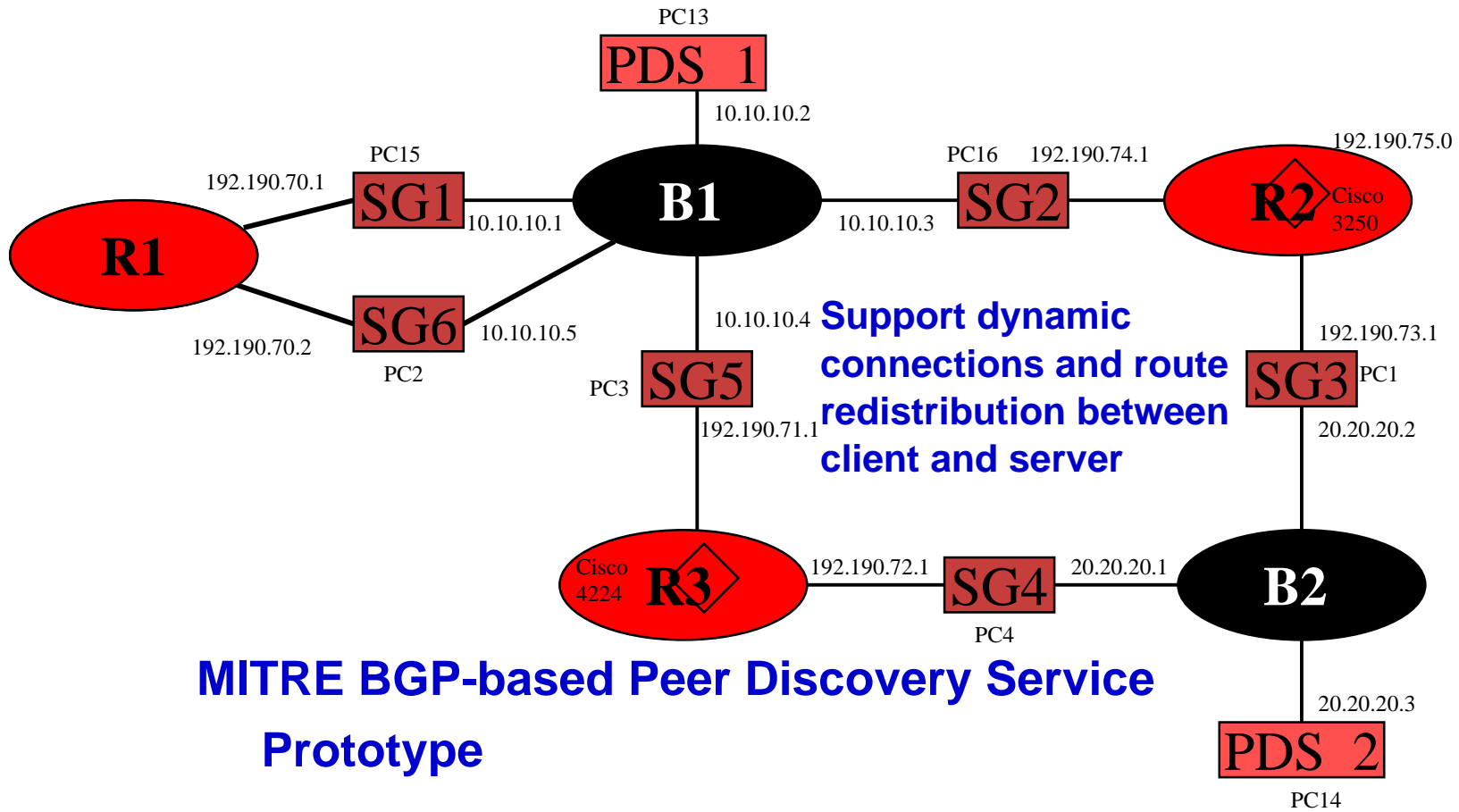
- **Develop discovery protocols/requirements and evaluate**
 - **DNS-like architecture**
 - **BGP based**
 - **Develop end-to-end routing requirements**
 - **Develop and evaluate prototype**
- **Develop multicast routing concepts using permitted protocols**
 - **Multicast transparency between red and black**

Highlight



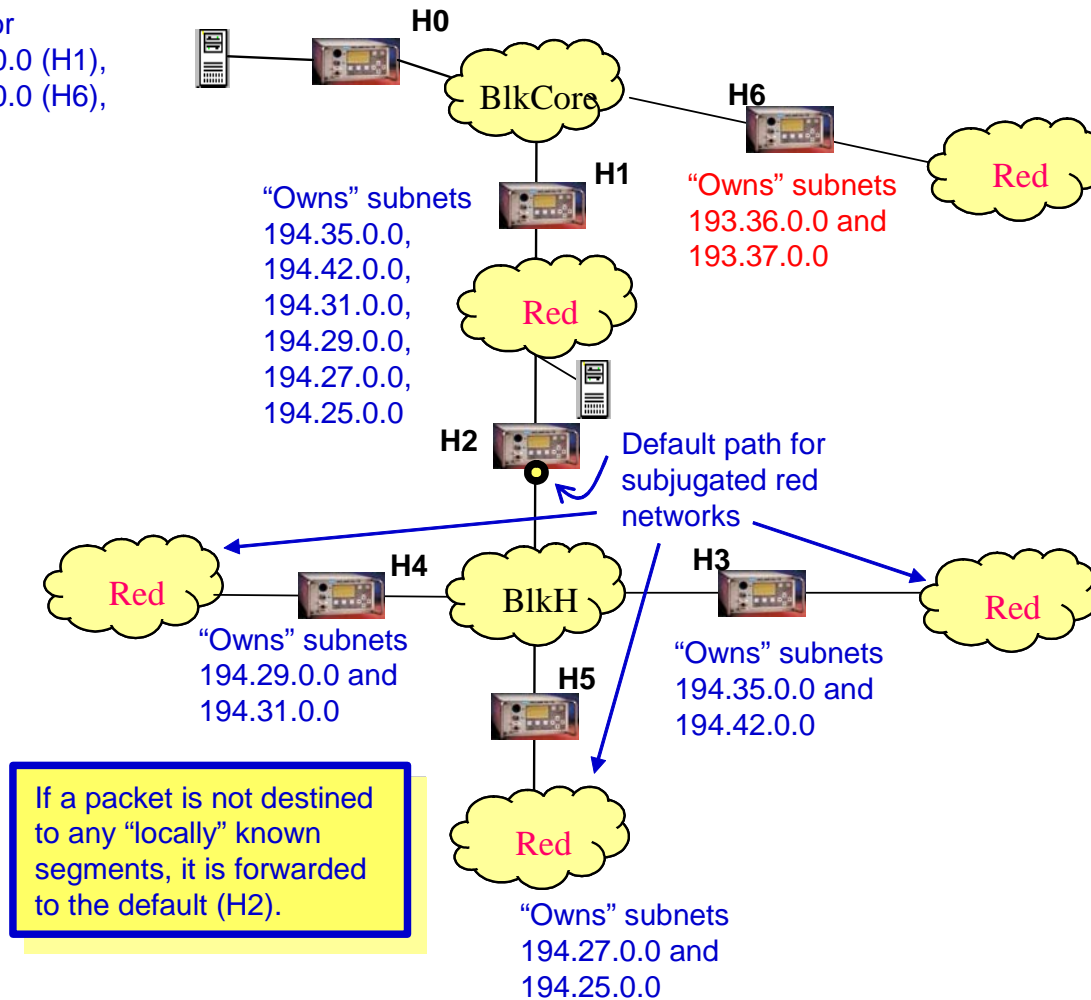
Protocol for Discovery and Unicast Routing

Demonstration



Demonstration

Root for
194.0.0.0 (H1),
193.0.0.0 (H6),
etc.



MITRE DNS-like Discovery Service Implementation

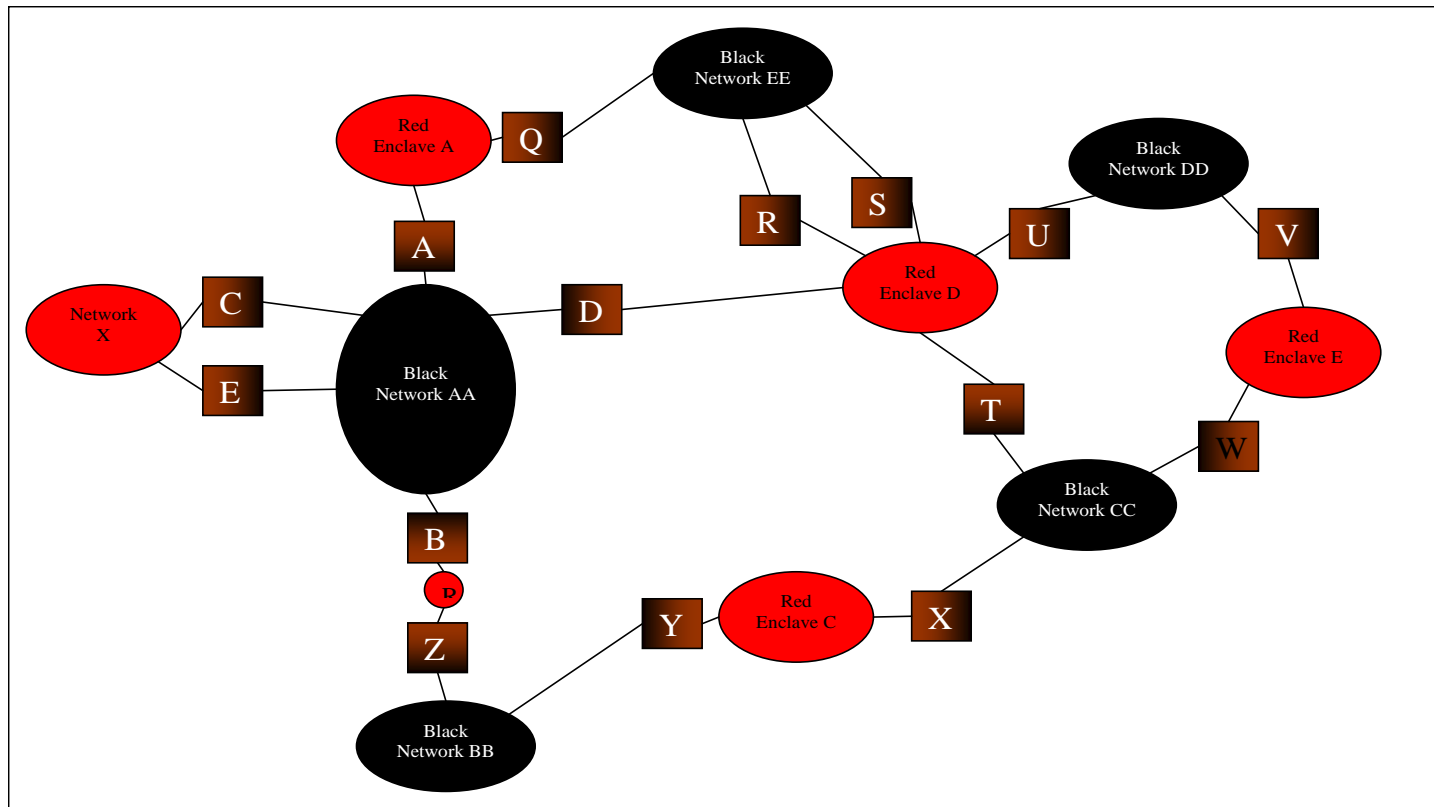
MITRE

© 2005, The MITRE Corporation

Impact

- *DoD Wide*
- Networks with “concatenated” sets of red-black-red enclaves will be supported
- New requirements for future HAIPE specifications will be proposed based upon experimentation
- This project will also set the foundation for experimenting with prefix discovery, address translation, and the routing architecture in environments using IP encryption

Future Plans



- Extend the routing architecture
- Integrate with larger testbeds and models
- Evaluate protocols in complex tactical networks