Exhibit R-2, RDT&E Budget Item Justification						Date: February 2008	
Appropriation/Budget Activity RDT&E, Dw BA 07			R-1 Item Nomenclature: Net Centricity, 0305199D8Z				
Cost ($ in millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	8.967	10.154	12.716	1.490	29.808	30.279	30.747
Horizontal Fusion, P199	0.000	0.000	0.00	0.000	19.099	19.570	19.913
GIG Evaluation Facilities (GIG-EF) and GIG End-to-End Systems Engineering Advisory Activities, P199	8.967	10.154	12.716	1.490	10.709	10.709	10.834

A. Mission Description and Budget Item Justification:

This program element will support information management and information technology activities focused on the development, integration, testing and assessment of capabilities and applications in support of joint and coalition warfighter needs. Resources will support net centric collaborative development and operations to improve situational awareness, interoperability and operational planning efforts. This program is funded under Budget Activity 7, Operational System Development, because it supports engineering development and testing of RDT&E activities.

The Horizontal Fusion Project funding was realigned by the Department to support priority net centric transformation efforts such as information assurance, Multinational Information Sharing and Internet Protocol (IP) based capability into military communications satellites.

	FY 2007	FY 2008	FY 2009
Previous President's Budget	8.696	10.243	12.747
Current Budget Estimates Submission	8.967	10.154	12.716
Total Adjustments	0.271		
Congressional program reductions			
Congressional increases			
Reprogrammings			
SIBR/STTR Transfer			
Program Adjustments	0.271	-0.089	-0.031

Exhibit R-2, RDT&E Budget Item Justification	Date: February 2008
Appropriation/Budget Activity RDT&E, Dw BA 07	R-1 Item Nomenclature: Net Centricity, 0305199D8Z

Program Change Explanation:
FY 2007: Rounding adjustment at the Department level 0.271 million.
FY 2008: FFRDC -$0.024 million, Contractor efficiencies -$0.016 million, Economic assumptions -$0.049 million.
FY 2009: Program adjustments of -$0.031 million due to inflation.

Exhibit R-2, RDT&E Budget Item Justification	Date: February 2008
Appropriation/Budget Activity RDT&E, Dw BA 07	R-1 Item Nomenclature: Net Centricity, 0305199D8Z

- Tangible products such as frameworks and design guidance used for program assessments and reviews.
- Specific modifications to Programs based on the frameworks and guidance that improve program compatibility and end to end performance.
- A more collaborative environment where systems engineering organizations of individual GIG programs and the end to end systems engineering oversight organization mutually identify and solve issues related to maximizing end to end performance

Exhibit R-2a, RDT&E Project Justification						Date: February 2008	
Appropriation/Budget Activity RDT&E, Dw BA 07			Project Name and Number: GIG Evaluation Facilities (GIG-EF) & GIG End-to-End SE Advisory Activities – P199				
Cost ($ in millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
GIG Evaluation Facilities (GIG-EF) & GIG End-to-End SE Advisory Activities – P199	8.967	10.154	12.716	1.490	10.709	10.709	10.834

A. **Mission Description and Budget Item Justification:** The Global Information Grid (GIG) Evaluation Facilities and E2E Systems Engineering (SE) Advisory Activities project provides resources needed to test key systems in an end-to-end manner, including providing for system engineers, test-bed hardware, software and fiber optic connectivity at the Naval Research Laboratory and several other test locations in the U.S. The evaluation facilities will be used to demonstrate interoperability of multiple Transformational Communications programs including but not limited to the Joint Tactical Radio System (JTRS), Global Information Grid Bandwidth Expansion (GIG BE), Teleports, and Transformational Satellite Communications System (TSAT). For these systems GIG-EF & SE would:

- Perform tests that physically demonstrate technical performance.
- Provide an independent, overarching review of technology and interface standards.
- Ensure technical issues are identified early and schedules synchronized to produce a jointly interoperable, timely and cost-effective architecture development.
- Prevent costly program reworks and restructuring, and more importantly, avoid delays in providing joint warfighter connectivity.

The effort also provides engineering, integration and hardware and fiber optic connectivity necessary to validate the performance for key transformational communication programs. The funding will also provide the engineering resources necessary for performing the Global Information Grid (GIG) end-to-end systems engineering oversight function. Resources will be applied to end-to-end systems engineering topics related to the successful integration of several programs that will form the GIG in areas such as information assurance (IA), quality of service (QOS), network management, interface definition and standards selection, and routing protocols. These resources will work in conjunction with systems engineers from key GIG programs such as the Joint Tactical Radio System (JTRS), Transformational Satellite Communications System (TSAT), Teleport, GIG Bandwidth Expansion (GIG-BE), Warfighters Internet-Tactical (WIN-T), Net-Centric Enterprise Services (NCES) and Automated Digital Networking System (ADNS) to identify and address technical issues resulting from engineering decisions made without the end- to-end perspective.

Exhibit R-2a, RDT&E Project Justification	Date: February 2008
Appropriation/Budget Activity RDT&E, Dw BA 07	Project Name and Number: GIG Evaluation Facilities (GIG-EF) & GIG End-to-End SE Advisory Activities – P199

B. Accomplishments/Planned Program

	FY 2007	FY 2008	FY 2009
Accomplishment/Effort/Subtotal Cost	8.967	10.154	12.716
RDT&E Articles Quantity	0	0	0

FY 2007 Accomplishments ($8.967 million)

- Applied systems engineering best practices to policy and configuration management requirements
- Developed concepts for GIG Enterprise Documentation Framework Phase I
- Reviewed JTRS Cluster AMF, TSAT and NCES for compliance to end to end GIG frameworks, architectures, and design guidance
- Analyzed end to end architecture and systems engineering issues by reviewing technical documentation, working with the systems engineering organizations of each of the programs, employing modeling and simulation, and using the results of end to end systems engineering testing and influence design changes to programs to assure compatibility and to maximize end to end performance
- Worked with Services and DoD Agencies to identify and address cross-program issues and influence programs to implement compatible designs that maximize end to end performance
- Continued support of GIG-EF capabilities and enhancements.
- Connected East and West coast GIG-EF hubs via 10Gbps service
- Performed End-to-End testing and experimentation in support of GIG developer and user requirements including, but not limited to:
  - HAIPE Discovery (DNS vs. BGP vs. LDAP) starting with emulators.
  - HAIPE Routing/QoS experiments
  - End-to-End QoS testing
    - End-to-End Routing and Multicast testing
  - JTRS JVL-N Testing
  - Moonv6 IPv6 participation
  - IPsec Control Plane segregation

.

Exhibit R-2a, RDT&E Project Justification	Date: February 2008
Appropriation/Budget Activity RDT&E, Dw BA 07	Project Name and Number: GIG Evaluation Facilities (GIG-EF) & GIG End-to-End SE Advisory Activities – P199

Quality of Protection and Anomaly Detection
Application Interoperability
IPv6-HAIPE Interoperability and Performance starting with emulators.

FY 2008 Plans ($10.154 million)
- Ensure the GIG end to end quality of service framework evolves in accordance with the evolution of commercial products, services, and technology
- Refine the GIG IA, routing architecture, and network management framework to be consistent with evolving commercial products, services, and technology
- Work with Services and Defense Agencies to identify and address cross-program issues and influence programs to implement compatible designs that maximize end to end performance
- Establish a GIG Technical Foundation compliance process to support existing DoD processes
- Develop an approach to integrate cross-organizational compliance processes into a single environment
- Establish a Configuration Management process to ensure EW SE inputs are incorporated into DoDD 8010
- Perform testing in support of GIG developer and user requirements to include but not be limited to:
  Data gathering and analysis of the net-centric test and evaluation infrastructure to identify gaps and issues
  GIG Technical Foundation Compliance Assessment
  Overlaps and shortfalls of the GIG E2E test infrastructure
  Interface across communities to instantiate GIG technical guidance through standards and product implementation
  IPv6 transition final testing
  JTRS WNW end-to-end testing in support of Cluster 5 (spiral 2), AMF.
  IPv6/MPLS experimentation and testing including early HAIPE concept development
  Support NCES spiral development
  Continued support of end-to-end warfighter interoperability experimentation via JRAE tests in coordination with USJFCOM JBMC2 activities
  Joint C2 applications and platform testing activities such as JITC
  HAIPE Discovery (DNS vs. BGP vs. LDAP) with HAIPIS v3 devices
  Mobile Routing testing

Exhibit R-2a, RDT&E Project Justification	Date: February 2008
Appropriation/Budget Activity RDT&E, Dw BA 07	Project Name and Number: GIG Evaluation Facilities (GIG-EF) & GIG End-to-End SE Advisory Activities – P199

HAIPE Routing/QoS experiments with mobile networks
End-to-End QoS testing with mobile networks
End-to-End Routing and Multicast testing with mobile networks
IPv6-HAIPE Interoperability and Performance starting with HAIPIS v3 devices
- Provide systems engineering and technical analyses and assessments to develop DoD Global Positioning System (GPS), Positioning, Navigation and Timing (PNT) and Navigation Warfare modernization systems
- Provide systems engineering and technical analyses and assessments for Space Control, Operations and Surveillance efforts as well as for AEHF, WGS and TSAT integration and connectivity to the GIG

FY 2009 Plans ($12.716 million)
- Ensure the GIG end to end quality of service framework evolves in accordance with the evolution of commercial products, services, and technology
- Work with Services and Defense Agencies to identify and address cross-program issues and influence programs to implement compatible designs that maximize end to end performance
- Continue to provide critical technology validation for GIG WGs, Components and Services/Users
- Finalize 40 Gb connectivity among DoD testing components (GIG-BE, TSAT, Teleports) and inter-connectivity to key GIG development sites including capability to support Inter-agency end-to-end testing with DoD, Intelligence Community, Allied and Coalition activities.
- Perform testing in support of GIG developer and user requirements including but not limited to:
Data gathering and analysis of the net-centric test and evaluation infrastructure to identify gaps and issues
GIG Technical Foundation Compliance Assessment
Overlaps and shortfalls of the GIG E2E test infrastructure
Interface across communities to instantiate GIG technical guidance through standards and product implementation
IPv6 transition final testing
JTRS WNW end-to-end testing in support of Cluster 5 (spiral 2), AMF.
IPv6/MPLS experimentation and testing including early HAIPE concept development
Support NCES spiral development
Continued support of end-to-end warfighter interoperability experimentation via JRAE tests in coordination with USJFCOM

Exhibit R-2a, RDT&E Project Justification	Date: February 2008
Appropriation/Budget Activity RDT&E, Dw BA 07	Project Name and Number: GIG Evaluation Facilities (GIG-EF) & GIG End-to-End SE Advisory Activities – P199

JBMC2 activities

Joint C2 applications and platform testing activities such as JITC
HAIPE Discovery (DNS vs. BGP vs. LDAP) with HAIPIS v3 devices
Mobile Routing testing
HAIPE Routing/QoS experiments with mobile networks
End-to-End QoS testing with mobile networks
End-to-End Routing and Multicast testing with mobile networks
IPv6-HAIPE Interoperability and Performance starting with HAIPIS v3 devices

- Provide systems engineering and technical analyses and assessments to develop DoD Global Positioning System (GPS), Positioning,
Navigation and Timing (PNT) and Navigation Warfare modernization systems
- Provide systems engineering and technical analyses and assessments for Space Control, Operations and Surveillance efforts as well as for AEHF, WGS and TSAT integration and connectivity to the GIG

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

E. Performance Metrics:

- User Activity and Participation. A key measurement of GIG-EF success is the amount of participation and usage of the GIG-EF in support of Joint warfighting requirements. Performance metrics in this area would include:
  - Number of events, tests and experiments scheduled
  - Percentage of GIG-EF time active vs. idle
  - Total amount of in-kind funding from GIG developers and activities
  - Aggregate funding per test
  - Number of service and user participants in tests (jointness)

Exhibit R-2a, RDT&E Project Justification	Date: February 2008
Appropriation/Budget Activity RDT&E, Dw BA 07	Project Name and Number: GIG Evaluation Facilities (GIG-EF) & GIG End-to-End SE Advisory Activities – P199

- Contributions to GIG development and transition. The GIG-EF should also advance the state of the art in support of GIG implementation.
  - Number of independent test reports and limited objective experiments support major GIG architectural issues (IA, IPv6/MPLS, Routing, etc.)
  - Number of demonstrations in support of major GIG architectural issues (IA, IPv6, Routing, etc.)

- Risk mitigation for the GIG.
  - Demonstrations in support of GIG overall goals (ex: IPv6 by FY 2008, 10 Gb Optical HAIPE by FY 2007, etc.)
  - Number of GIG E2E Systems Engineering Oversight working group requirements addressed via GIG-EF demonstration, experimentation and testing.

- Tangible products such as frameworks and design guidance used for program assessments and reviews.
- Specific modifications to Programs based on the frameworks and guidance that improve program compatibility and end to end performance.
- A more collaborative environment where systems engineering organizations of individual GIG programs and the end to end systems engineering oversight organization mutually identify and solve issues related to maximizing end to end performance.