

**UNCLASSIFIED**

**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Army **Date:** February 2020

<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 3: Advanced Technology Development (ATD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603461A / <i>High Performance Computing Modernization Program</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	211.457	224.755	188.024	-	188.024	191.463	197.623	198.323	201.064	0.000	1,412.709
<i>DS7: High Performance Computing Modernization Program</i>	-	176.457	224.755	188.024	-	188.024	191.463	197.623	198.323	201.064	0.000	1,377.709
<i>DW5: HIGH PERF COMP MODERN (HPCM) (CA)</i>	-	35.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	35.000

**A. Mission Description and Budget Item Justification**

The High Performance Computing Modernization Program (HPCMP) addresses the supercomputing requirements of Department of Defense (DoD) scientists and engineers by: (1) demonstrating and maturing the most advanced, leading-edge computational architectures while exploiting the resulting systems by employing complementary specialized expertise; (2) demonstrating and maturing the Defense Research and Engineering Network (DREN), which investigates, demonstrates, and matures leading-edge digital networking and security technologies to securely deliver computational capabilities to the distributed DoD Research, Development, Test, and Evaluation (RDTE) community; and (3) leveraging specialized expertise from DoD, other federal departments and agencies, industry, and academia to demonstrate and mature leading-edge software application codes. DoD Supercomputing Resource Centers (DSRCs) provide extensive computational capabilities to demonstrate and mature emerging technologies that address the supercomputing requirements of the DoD RDTE community in the areas of hardware, software, and programming environments. All HPCMP sites are interconnected to each other, the DoD High Performance Computing (HPC) RDTE community, and other major defense sites via the DREN, a research network which investigates, demonstrates, and matures (a) state-of-the-art digital networking technologies to ensure a robust distributed environment and (b) the most advanced digital security capabilities to protect the intellectual property of the DoD and its contract entities as they employ HPCMP capabilities. The HPCMP's software application effort (a) optimizes, enhances, demonstrates, and matures critical DoD physics-based and engineering software to allow scientists and engineers to execute calculations with precision and efficiency on leading-edge supercomputers, (b) demonstrates and matures immersive collaborative programming environments to improve science and engineering workflows, and (c) demonstrates and matures leading-edge computational technology from academia and industry. These synergistic activities collectively demonstrate and mature horizontal technologies that are exploited across the DoD RDTE community, ensuring the DoD maintains the most advanced research and development ecosystem in computationally-intensive modeling and design.

The work cited is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

**UNCLASSIFIED**

**Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 3: Advanced Technology Development (ATD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603461A / <i>High Performance Computing Modernization Program</i>
---	---

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	218.098	184.755	188.205	-	188.205
Current President's Budget	211.457	224.755	188.024	-	188.024
Total Adjustments	-6.641	40.000	-0.181	-	-0.181
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	40.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-6.641	-			
• Adjustments to Budget Years	-	-	-0.181	-	-0.181

**Congressional Add Details (\$ in Millions, and Includes General Reductions)**

**Project: DS7: High Performance Computing Modernization Program**

Congressional Add: *Program Increase*

Congressional Add Subtotals for Project: DS7

**Project: DW5: HIGH PERF COMP MODERN (HPCM) (CA)**

Congressional Add: *Congressional Increase*

Congressional Add Subtotals for Project: DW5

Congressional Add Totals for all Projects

	<b>FY 2019</b>	<b>FY 2020</b>
	-	37.967
	-	37.967
	35.000	-
	35.000	-
	35.000	37.967

**Change Summary Explanation**

FY20 increase related to FY20 Congressional Adds.

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Army										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 2040 / 3					<b>R-1 Program Element (Number/Name)</b> PE 0603461A / High Performance Computing Modernization Program				<b>Project (Number/Name)</b> DS7 / High Performance Computing Modernization Program			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
DS7: High Performance Computing Modernization Program	-	176.457	224.755	188.024	-	188.024	191.463	197.623	198.323	201.064	0.000	1,377.709

**A. Mission Description and Budget Item Justification**

The High Performance Computing Modernization Program (HPCMP) addresses the supercomputing requirements of Department of Defense (DoD) scientists and engineers by (1) demonstrating and maturing the most advanced, leading-edge computational architectures and exploiting the resulting systems by employing complementary specialized expertise; (2) demonstrating and maturing the Defense Research and Engineering Network (DREN) which investigates, demonstrates, and matures leading-edge digital networking and security technologies to securely deliver computational capabilities to the distributed DoD Research, Development, Test, and Evaluation (RDTE) community; and (3) leveraging specialized expertise from DoD, other federal departments/agencies, industry, and academia to demonstrate and mature leading-edge software application codes. DoD Supercomputing Resource Centers (DSRCs) provide extensive computational capabilities and demonstrate and mature emerging technologies that address the supercomputing requirements of the DoD RDTE community in the areas of hardware, software, and programming environments. All HPCMP sites are interconnected to each other, the DoD High Performance Computing (HPC) RDTE community, and other major defense sites via DREN, a research network which investigates, demonstrates, and matures (a) state-of-the-art digital networking technologies to ensure a robust distributed environment and (b) the most advanced digital security capabilities to effectively protect the intellectual property of the DoD and its contract entities as they employ HPCMP advanced capabilities. The HPCMP's software application effort (a) optimizes, enhances, demonstrates, and matures critical DoD physics-based and engineering software to allow scientists and engineers to execute calculations with precision and efficiency on leading-edge supercomputers, (b) demonstrates and matures immersive collaborative programming environments to improve science and engineering workflows, and (c) demonstrates and matures leading-edge computational technology from academia and industry. These synergistic activities collectively demonstrate and mature horizontal technologies that are exploited throughout the DoD RDTE community, ensuring the DoD maintains the most advanced research ecosystem in the areas of computationally-intensive modeling and design.

The work cited is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

**B. Accomplishments/Planned Programs (\$ in Millions)**

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> Department of Defense Supercomputing Resource Centers	93.484	95.848	99.611
<b>Description:</b> The effort investigates, demonstrates, and matures general and special-purpose supercomputing environments that incorporate the most advanced, leading-edge computational architectures, distributed mass storage technologies, and data analysis methodologies; employs complementary specialized expertise to mature and exploit these environments; enables the DoD RDTE community to effectively and efficiently investigate, demonstrate, and mature a broad range of technologies through advanced computational methods.			
<b>FY 2020 Plans:</b>			

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Army		<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 2040 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603461A / <i>High Performance Computing Modernization Program</i>	<b>Project (Number/Name)</b> DS7 / <i>High Performance Computing Modernization Program</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>Accelerate technology capabilities with a suite of supercomputers to address DoD priorities that satisfy the diverse needs of DoD stakeholders including security, workload, and architecture requirements. Refine and exploit the advanced capabilities of previously demonstrated supercomputers (utilize the existing capability to complete 54,000 trillion floating point operations per second) to conduct complex, tightly-coupled, large-scale, scientific calculations to address DoD challenges in the essential computational domains. Demonstrate the potential benefits of multiple architectures (scientific, analytics, machine learning, etc.) that are tightly-integrated and incorporate leading-edge (i.e. 2020) processor, memory, disk input/output (I/O), interconnect, and operating system (OS) capabilities. Demonstrate enhanced access solutions to supercomputers ? solutions that do not require software to be added to the client machine to allow scientists and engineers located at sites with prohibitive security practices to access supercomputers. Demonstrate new mechanisms to access and reduce barriers to supercomputers. Leverage data-intensive supercomputing architectures for DoD use cases in machine learning, artificial intelligence, and data sciences.</p> <p><b>FY 2021 Plans:</b> Will continue to accelerate technology capabilities with a suite of supercomputers to address DoD priorities that satisfy the diverse needs of DoD stakeholders including security, workload, and architecture requirements. Will continue to enhance and exploit the advanced capabilities of previously demonstrated supercomputers to conduct complex, tightly-coupled, large-scale, scientific calculations to address DoD challenges in the essential computational domains. Will demonstrate the potential benefits of multiple architectures (scientific, analytics, machine learning, etc.) that are tightly-integrated and incorporate leading-edge processors, memory, disk I/O, interconnect, and OS capabilities. Will demonstrate new mechanisms to access and reduce barriers to supercomputers. Will leverage data-intensive supercomputing architectures for DoD use cases in machine learning, artificial intelligence, and data sciences.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Funding change reflects planned lifecycle of this effort.</p>				
<p><b>Title:</b> Defense Research and Engineering Network</p> <p><b>Description:</b> This effort investigates, demonstrates, and matures state-of-the-art digital networking technologies to ensure a robust distributed environment among HPCMP sites, the DoD HPC RDTE community, and other major defense sites; investigates, demonstrates, and matures the most advanced digital security capabilities to effectively protect the intellectual property of the DoD and its contract entities as they employ HPCMP advanced capabilities; employs complementary specialized expertise to mature and exploit this environment.</p> <p><b>FY 2020 Plans:</b> Continue to refine and exploit DREN III (an advanced digital DoD research network) which provides robust, high-bandwidth, low-latency, low-jitter connectivity among the HPCMP and DoD RDTE communities with specific efforts targeted at the unique requirements of the Test &amp; Evaluation (T&amp;E) and Acquisition Engineering communities. Formalize the strategic technical</p>		30.946	30.367	32.973

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Army		<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 2040 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603461A / <i>High Performance Computing Modernization Program</i>	<b>Project (Number/Name)</b> DS7 / <i>High Performance Computing Modernization Program</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>planning and acquisition strategy development for DREN IV, the follow-on to DREN III, with next-generation technical capabilities and significantly increased bandwidths to support the HPCMP and DoD RDTE communities; complete source selection for DREN IV. Complete final configuration and fine tune the Identity Aware Proxy (IAP) Security Gateway Enhancement Project to enhance HPCMP's Defense Information Systems Agency (DISA) accredited Tier 2 cybersecurity service provider capability to effectively protect the intellectual property of the DoD and its contract entities as they utilize HPCMP advanced capabilities. Continue to mature the advanced network technologies and complex cybersecurity mechanisms required to implement logically-separated networked COIs at multiple classification levels. Continue to demonstrate hardware architecture and software stack enhancements for network sensors to simultaneously allow; (1) active support for the HPCMP's DISA-accredited Tier 2 cybersecurity service provider capabilities; and (2) active experimentation for novel, adaptive cybersecurity detection and intervention methods; Implement the ability to employ SDNs to allow traditional IP and experimental protocol networks to coexist within a common DoD networking infrastructure. Implement a prototype ISCM and cyber situational awareness capability to ingest robust, diverse, host-based and network-based near-real-time information by harnessing HPC resources for advanced mission essential task elements.</p> <p><b>FY 2021 Plans:</b> Will continue to refine and exploit DREN (an advanced digital DoD research network) which provides robust, high-bandwidth, low-latency, low-jitter connectivity among the HPCMP and DoD RDTE communities with specific efforts targeted at the unique requirements of the T&amp;E and Acquisition Engineering communities. Will finalize the strategic technical planning and acquisition strategy development for DREN IV, the follow-on to DREN III, with next-generation technical capabilities and significantly increased bandwidths to support the HPCMP and DoD RDTE communities; will complete source selection for DREN IV. Will complete and fine tune the IAP Security Gateway Enhancement Project to enhance HPCMP's DISA-accredited Tier 2 cybersecurity service provider capability to effectively protect the intellectual property of the DoD and its contract entities as they utilize HPCMP advanced capabilities. Will continue to mature the advanced network technologies and complex cybersecurity mechanisms required to implement logically-separated networked COIs at multiple classification levels.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Funding change reflects planned lifecycle of this effort.</p>				
<p><b>Title:</b> Software Applications</p> <p><b>Description:</b> This effort optimizes, enhances, demonstrates, and matures software applications to provide for the adaptation of widely used applications and algorithms to address RDTE requirements. The Computational Research Engineering Acquisition Tools and Environments (CREATE) initiative demonstrates and matures advanced application codes to allow scientists and engineers to use supercomputers to design and analyze virtual prototypes of DoD ships, fixed-wing aircraft, rotorcraft, ground vehicles, and radio frequency (RF) antennas; HPCMP Institutes demonstrate and mature advanced supercomputing application codes to address critical high-impact DoD challenges (e.g. blast protection</p>		52.027	52.442	55.440

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Army		<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 2040 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603461A / <i>High Performance Computing Modernization Program</i>	<b>Project (Number/Name)</b> DS7 / <i>High Performance Computing Modernization Program</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>for platforms and personnel, high-power microwaves and lasers, munition sensitivities, and mobile network designs/prototypes); High Performance Computing Applications Software Initiative (HASI) projects address the need to mature and refine critical DoD software that can take advantage of new and emerging hardware advances; the Frontier initiative represents and supports the DoD's highest-priority, highest-impact, most demanding computational work, both from a technical and mission-relevance standpoint; the Productivity, Enhancement, Technology Transfer, and Training (PETTT) initiative (1) optimizes and enhances critical DoD physics based and engineering software to allow scientists and engineers to execute scientific calculations with precision and efficiency on leading-edge supercomputers, (2) demonstrates and matures immersive collaborative programming environments to improve science and engineering workflows, and (3) demonstrates and matures leading-edge computational technology from academia and industry.</p> <p><b>FY 2020 Plans:</b> Continue to mature and enhance multi-disciplinary software technology in support of current and future defense programs. For aeronautical systems of all types (i.e., fixed and rotary-wing aircraft, munitions, missiles, rockets, etc.), this endeavor will continue to mature model-centric conceptual design software technology to support pre Milestone-A Defense acquisition processes, enabling application of physics-based analysis of alternatives, technology trade-space exploration, and analysis of cost implications. Continue implementation of foundational software improvements necessary to begin development of physics-based design analysis tools for future hypersonic weapon systems (High Speed Strike, Tactical Boost-Glide, and Manned/Unmanned Conventional Prompt Global Strike). For fixed-wing aircraft, will a) incorporate new generation of high order accuracy solvers; b) implement hypersonic terminal maneuvers; and c) begin incorporation of hypersonic long-duration/heat soak algorithms. For rotorcraft, continue aeromechanics analysis associated with maneuvers, airframe-propulsion system integration, and weapons carriage and release, as well as infrared suppression analysis, chaff trajectory prediction, debris ingestion analysis, and loads prediction capability necessary for structural airworthiness assessments. These capabilities will be deployed in support of the Future Vertical Lift (FVL) Program, as well as for sustainment of existing rotorcraft-based programs and associated upgrades. RF antenna design and analysis is maturing computational electromagnetics capabilities to assist in design and evaluation of next generation radar for aircraft, ships, and ground-based platforms; demonstrate capability for assessment of electromagnetic hazards on ordnance and optimizing computational methods for electronic warfare assessments and evaluation of multiple antenna systems on a single platform. Conclude efforts in aircraft radar signature prediction capabilities that effectively include propulsion system inlet and exhaust. Continue efforts to incorporate high-resolution (X-Band frequencies) virtual test and analysis capabilities for fighter-scale aircraft. For Naval Ships (surface and submarine), continue incorporation of; a) hullform optimization; b) multi-hull seakeeping capabilities; and c) virtual ship powering algorithms. Begin efforts to incorporate 6-DOF submarine maneuvering. For Ground Vehicles a) complete advanced model interfacing standards; b) complete incorporation of sensing and autonomy capabilities; and c) expand autonomy capabilities.</p> <p><b>FY 2021 Plans:</b></p>				

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Army		<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 2040 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603461A / <i>High Performance Computing Modernization Program</i>	<b>Project (Number/Name)</b> DS7 / <i>High Performance Computing Modernization Program</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>Will continue to mature and enhance multi-disciplinary software technology in support of current and future defense programs. For aeronautical systems of all types (i.e., fixed and rotary-wing aircraft, munitions, missiles, rockets, etc.), this endeavor will continue to mature model-centric conceptual design software technology to support pre Milestone-A Defense acquisition processes, enabling application of physics-based analysis of alternatives, technology trade-space exploration, and analysis of cost implications. Will continue implementation of foundational software improvements necessary to begin development of physics-based design analysis tools for future hypersonic weapon systems (High Speed Strike, Tactical Boost-Glide, and Manned/Unmanned Conventional Prompt Global Strike). For fixed-wing aircraft, a) will continue incorporating new generation of high order accuracy solvers; b) will continue implementing hypersonic terminal maneuvers; and c) will continue incorporating hypersonic long-duration/heat soak algorithms. For rotorcraft, will continue aeromechanics analysis associated with maneuvers, airframe-propulsion system integration, and weapons carriage and release, as well as infrared suppression analysis, chaff trajectory prediction, debris ingestion analysis, and loads prediction capability necessary for structural airworthiness assessments. RF antenna design and analysis will continue to mature computational electromagnetics capabilities to assist in design and evaluation of next generation radar for aircraft, ships, and ground-based platforms; will continue demonstrating capability for assessment of electromagnetic hazards on ordnance and optimizing computational methods for electronic warfare assessments and evaluation of multiple antenna systems on a single platform. Will continue to include efforts in aircraft radar signature prediction capabilities that effectively include propulsion system inlet and exhaust. Will continue efforts to incorporate high-resolution (X-Band frequencies) virtual test and analysis capabilities for fighter-scale aircraft. For Naval Ships (surface and submarine), will continue incorporation of; a) hullform optimization; b) multi-hull seakeeping capabilities; and c) virtual ship powering algorithms. Will continue to incorporate 6-D0F submarine maneuvering. For Ground Vehicles will continue to expand autonomy capabilities.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Funding change reflects planned lifecycle of this effort.</p>				
<p><b>Title:</b> FY 2020 SBIR/STTR Transfer</p> <p><b>Description:</b> Funding transferred in accordance with Title 15 USC ?638</p> <p><b>FY 2020 Plans:</b> Funding transferred in accordance with Title 15 USC ?638</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Funding transferred in accordance with Title 15 USC ?638</p>		-	8.131	-
<b>Accomplishments/Planned Programs Subtotals</b>		176.457	186.788	188.024
		<b>FY 2019</b>	<b>FY 2020</b>	
<b>Congressional Add:</b> Program Increase		-	37.967	

**UNCLASSIFIED**

**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Army **Date:** February 2020

<b>Appropriation/Budget Activity</b> 2040 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603461A / <i>High Performance Computing Modernization Program</i>	<b>Project (Number/Name)</b> DS7 / <i>High Performance Computing Modernization Program</i>
--	---	---

	FY 2019	FY 2020
<b>FY 2020 Plans:</b> Program Increase		
<b>Congressional Adds Subtotals</b>	-	37.967

**C. Other Program Funding Summary (\$ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

**UNCLASSIFIED**

**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Army **Date:** February 2020

<b>Appropriation/Budget Activity</b> 2040 / 3					<b>R-1 Program Element (Number/Name)</b> PE 0603461A / High Performance Computing Modernization Program				<b>Project (Number/Name)</b> DW5 / HIGH PERF COMP MODERN (HPCM) (CA)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
DW5: HIGH PERF COMP MODERN (HPCM) (CA)	-	35.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	35.000

**A. Mission Description and Budget Item Justification**

This project enables the Defense Research, Development, Test and Evaluation (RDT&E) community to resolve critical scientific and engineering problems more quickly, and with more precision, using advanced, physics-based computer simulation supported by high performance computing (HPC) technology. The computational expertise and resources enable Department of Defense (DoD) personnel to analyze phenomena that are often impossible, not cost effective, too time-consuming, or too dangerous to study any other way. The High Performance Computing Modernization Program (HPCMP) supports the requirements of the DoD's scientists and engineers in three major areas of effort: supercomputing resource centers, the Defense Research and Engineering Network (DREN), and software applications. DoD Supercomputing Resource Centers (DSRCs) provide extensive capabilities and demonstrate new technologies that address user requirements for hardware, software, and programming environments. Efforts of the DSRCs are augmented by dedicated HPC project investments (DHPIs) that address near real-time and real-time HPC requirements. All sites in the HPC Modernization Program are interconnected to one another, the user community, and major defense sites via the DREN, a research network which matures and demonstrates state-of-the-art computer network technologies. The Software Application effort optimizes and improves the performance of critical common DoD applications programs to run efficiently on advanced HPC systems, matures and demonstrates leading-edge computational technology from academic and commercial partners, and provides collaborative programming environments.

The work cited is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

**B. Accomplishments/Planned Programs (\$ in Millions)**

	<b>FY 2019</b>	<b>FY 2020</b>
<b>Congressional Add:</b> Congressional Increase	35.000	-
<b>FY 2019 Accomplishments:</b> Congressional Increase		
<b>Congressional Adds Subtotals</b>	35.000	-

**C. Other Program Funding Summary (\$ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

N/A