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Pentagon Envisioning a Costly Internet for War

By TIM WEINER

The Pentagon is building its own Internet, the military's world wide web for the wars of the future.

The goal is to give all American commanders and troops a moving picture of all foreign enemies and threats - "a God's-eye view" of battle.

This "Internet in the sky," Peter Teets, under secretary of the Air Force, told Congress, would allow "marines in a Humvee, in a faraway land, in the middle of a rainstorm, to open up their laptops, request imagery" from a spy satellite, and "get it downloaded within seconds."

The Pentagon calls the secure network the Global Information Grid, or GIG. Conceived six years ago, its first connections were laid six weeks ago. It may take two decades and hundreds of billions of dollars to build the new war net and its components.

Skeptics say the costs are staggering and the technological hurdles huge.

Vint Cerf, one of the fathers of the Internet and a Pentagon consultant on the war net, said he wondered if the military's dream was realistic. "I want to make sure what we realize is vision and not hallucination," Mr. Cerf said.

"This is sort of like Star Wars, where the policy was, 'Let's go out and build this system,' and technology lagged far behind," he said. "There's nothing wrong with having ambitious goals. You just need to temper them with physics and reality."

Advocates say networked computers will be the most powerful weapon in the American arsenal. Fusing weapons, secret intelligence and soldiers in a global network - what they call net-centric warfare - will, they say, change the military in the way the Internet has changed business and culture.

"Possibly the single most transforming thing in our force," Defense Secretary Donald H. Rumsfeld has said, "will not be a weapons system, but a set of interconnections."

The American military, built to fight nations and armies, now faces stateless enemies without jets, tanks, ships or central headquarters. Sending secret intelligence and stratagems instantly to soldiers in battle would, in theory, make the military a faster, fiercer force against a faceless foe.

Robert J. Stevens, chief executive of the Lockheed Martin Corporation, the nation's biggest military contractor, said he envisioned a "highly secure Internet in which military and intelligence activities are fused," shaping 21st-century warfare in the way that nuclear weapons shaped the cold war.

Every member of the military would have "a picture of the battle space, a God's-eye view," he said.

"And that's real power."

Pentagon traditionalists, however, ask if net-centric warfare is nothing more than an expensive fad. They point to the street fighting in Falluja and Baghdad, saying firepower and armor still mean more than fiber optic cables and wireless connections.

But the biggest challenge in building a war net may be the military bureaucracy. For decades, the Army, Navy, Air Force and Marines have built their own weapons and traditions. A network, advocates say, would cut through those old ways.

The ideals of this new warfare are driving many of the Pentagon's spending plans for the next 10 to 15 years. Some costs are secret, but billions have already been spent.

Providing the connections to run the war net will cost at least $24 billion over the next five years - more than the cost, in today's dollars, of the Manhattan Project to build the atomic bomb. Beyond that, encrypting data will be a $5 billion project.

Hundreds of thousands of new radios are likely to cost $25 billion. Satellite systems for intelligence, surveillance, reconnaissance and communications will be tens of billions more. The Army's program for a war net alone has a $120 billion price tag.

Over all, Pentagon documents suggest, $200 billion or more may go for the war net's hardware and software in the next decade or so. "The question is one of cost and technology," said John Hamre, a former deputy secretary of defense, now president of the Center for Strategic and International Studies in Washington.

"We want to know all things at all times everywhere in the world? Fine," Mr. Hamre said. "Do we know what this staring, all-seeing eye is that we're going to put in space is? Hell, no."

The military wants to know "everything of interest to us, all the time," in the words of Steven A. Cambone, the under secretary of defense for intelligence. He has told Congress that military intelligence - including secret satellite surveillance covering most of the earth - will be posted on the war net and shared with troops.

John Garing, strategic planning director at the Defense Information Security Agency, now starting to build the war net, said: "The essence of net-centric warfare is our ability to deploy a war-fighting force anywhere, anytime. Information technology is the key to that."

Military contractors - and information-technology creators not usually associated with weapons systems - formed a consortium to develop the war net on Sept. 28. The group includes an A-list of military contractors and technology powerhouses: Boeing; Cisco Systems; Factiva, a joint venture of Dow Jones and Reuters; General Dynamics; Hewlett-Packard; Honeywell; I.B.M.; Lockheed Martin; Microsoft; Northrop Grumman; Oracle; Raytheon; and Sun Microsystems. They are working to weave weapons, intelligence and communications into a seamless web.

The Pentagon has tried this twice before.

Its Worldwide Military Command and Control System, built in the 1960's, often failed in crises. A $25 billion successor, Milstar, was completed in 2003 after two decades of work. Pentagon officials say it is already outdated: more switchboard than server, more dial-up than broadband, it cannot support 21st-

century technology.

The Pentagon's scientists and engineers, starting four decades ago, invented the systems that became the Internet. Throughout the cold war, their computer power ran far ahead of the rest of the world.

Then the world eclipsed them. The nation's military and intelligence services started falling behind when the Internet exploded onto the commercial scene a decade ago. The war net is "an attempt to catch up," Mr. Cerf said.

It has been slowly evolving for at least six years. In 1999, Pentagon officials told Congress that "this monumental task will span a quarter-century or more." This year, the vision gained focus, and Pentagon officials started explaining it in some detail to Congress.

Its scope was described in July by the Government Accountability Office, the watchdog agency for Congress.

Many new multibillion-dollar weapons and satellites are "critically dependent on the future network," the agency reported. "Despite enormous challenges and risks - many of which have not been successfully overcome in smaller-scale efforts" like missile defense, "the Pentagon is depending on the GIG to enable a fundamental transformation in the way military operations are conducted."

According to Art Cebrowski, director of the Pentagon's Office of Force Transformation, "What we are really talking about is a new theory of war."

Linton Wells II, the chief information officer at the Defense Department, said net-centric principles were becoming "the center of gravity" for war planners.

"The tenets are broadly accepted throughout the Defense Department," said Mr. Wells, who directs the Office of Networks and Information Integration. "Senior leadership can articulate them. We still have a way to go in terms of why we should spend X billion dollars on a certain program. In the fight between widgets and digits, widgets tend to win."

He said $24 billion would be spent in the next five years to build new war net connections. "No doubt these are expensive," Mr. Wells said. "Technology developments always are."

Advocates acknowledge that weaving American military and intelligence services into a unified system is a huge challenge.

The military is filled with "tribal representatives behind tribal workstations interpreting tribal hieroglyphics," in the words of Gen. John Jumper, the Air Force chief of staff. "What if the machines talked to each other?" he asked.

That is the vision of the new web: war machines with a common language for all military forces, instantly emitting encyclopedias of lethal information against all enemies.

To realize this vision, the military must solve a persistent problem. It all boils down to bandwidth.

Bandwidth measures how much data can flow between electronic devices. Too little for civilians means a Web page takes forever to load. Too little for soldiers means the war net will not work.

The bandwidth requirements seem bottomless. The military will need 40 or 50 times what it used at the height of the Iraq war last year, a Rand Corporation study estimates - enough to give front-line soldiers bandwidth equal to downloading three feature-length movies a second.

The Congressional Research Service said the Army, despite plans to spend $20 billion on the problem, may wind up with a tenth of the bandwidth it needs. The Army, in its "lessons learned" report from Iraq, published in May, said "there will probably never be enough resources to establish a complete and functioning network of communications, sensors, and systems everywhere in the world."

The bottleneck is already great. In Iraq, front-line commanders and troops fight frequent software freezes. "To make net-centric warfare a reality," said Tony Montemarano, the Defense Information Security Agency's bandwidth expansion chief, "we will have to precipitously enhance bandwidth."

The military must also change its own culture.

For decades, the Army, Navy, Air Force and Marines have built separate weapons, radios, frequencies and traditions. They guard their "rice bowls" - their turf - from rival services.

But Mr. Rumsfeld's vision depends on interoperability: warfare using all four services in joint operations.

In a net-centric world, "you would not have a Army, Navy, Air Force and Marines," but a unified force, said William Owens, a former vice chairman of the Joint Chiefs of Staff.

For the Pentagon's visionaries, Mr. Montemarano said, "the single biggest obstacle is a cultural one."

"Breaking these rice bowls - that's a huge job."