
Another STEP CLOSER

WIN-T Increment 2 provides solutions to network challenges

by COL Chuck Hoppe and LTC Rob Collins

As the Army continues to bring new capabilities to bear on its warfighting mission, Warfighter Information Network-Tactical (WIN-T) Increment 2 will provide on-the-move (OTM), high-capacity satellite communications down to the company echelon for the first time, as well as an integrated high-capacity terrestrial and satellite communications network at the battalion level and above. The WIN-T program emerged four years ago from the Nunn/McCurdy process of controlling program costs as a new program—or, more accurately, four new programs.

The former Joint Network Node program was redesignated as Increment 1 with some changes. The Army has used Increment 1 for the past six years and is quickly nearing completion on fielding the 217 unit flags.

The “big bang” WIN-T program was divided up, creating three additional programs with incremental capability builds. One of these programs, WIN-T Increment 2, is the initial OTM capability and is soon to go to its first Army unit.

INCREMENTAL CAPABILITIES

Similar to a home Internet connection, WIN-T Increment 1, the current tactical backbone, provides high-speed, high-capacity voice, data, and video communications to units on the battlefield, at-the-halt (ATH), or at-the-quick-halt.

Unlike a home Internet connection, WIN-T Increment 2 provides this network to the formation while it is OTM. From an acquisition program perspective, WIN-T Increment 2 is post-Milestone

C; the program is in low-rate initial production and is preparing for initial operational test and evaluation (IOT&E) in FY12.

The program office is using the remaining time before the IOT&E to complete developmental testing, characterize the network, assess safety release requirements, validate training materials, and evaluate logistics support processes before new equipment fielding and training. The program management and prime contractor team are setting conditions now so that when fielding begins in early 2012, program configuration items are producible in the quantities and timeframe needed and meet the reliability and maintainability requirements that ensure the equipment is dependable, complete, and capable of doing what is needed.



WIN-T INCREMENT 2

CW5 Leslie Cornwall (left) and MAJ Marcus Odum from the U.S. Army Training and Doctrine Command Capabilities Manager Networks and Services examine WIN-T equipment during a WIN-T Increment 2 Engineering Field Test at Fort Huachuca, AZ. (U.S. Army photo courtesy of Program Executive Office Command, Control, and Communications-Tactical (PEO C3T).)

capability to the company commander. The SNE's primary purpose is to provide a combat radio network extension to "heal" tactical radio nets using the larger WIN-T backbone.

A side benefit is that the company commander's vehicle becomes a lower-level node connected directly to the larger WIN-T backbone.

The SNE's combat radio network extension was specifically designed for lower-echelon radio nets, such as Soldier Radio Waveform, Enhanced Position Location Reporting System, and Single Channel Ground and Airborne Radio System. These can be broken into separate networks, or fractured, because of terrain features between formations that make line-of-sight communications impossible.

The SNE has the capability to heal that network over the SATCOM component of the WIN-T network. But, because it is a node in the WIN-T network, the company commander's vehicle now has limited network connectivity to the tactical backbone, both ATH and OTM.

FACILITATING OPERATIONS

Another challenge throughout the Army formation, and a major challenge for the S-6, is network operations (NetOps): the planning, administration, management, response, initialization, and spectrum and frequency allocation of the network.

WIN-T Increment 2 introduces the framework that begins to integrate the NetOps tools behind a single standard

human computer interface, almost like a "digital dashboard." It also marks the beginning of policy-based network management of the tactical network.

The S-6 and G-6, based on the commander's intent and mission execution, now have the tools to manage spectrum very much like we currently manage and prioritize indirect fires. WIN-T Increment 2 also allows an unprecedented level of digital participation by the S-6 and G-6 in the military decision-making process.

Key to the planning and execution is the initial capability in the tools provided to plan the network and "weight the main effort."

As an example, if a battalion is the main effort, it can be allocated priority for message traffic by adjusting the quality of service (QoS) of the traffic in the network. If the battalion needs additional bandwidth, that, too, can be adjusted.

These policies can be pushed out to the WIN-T nodes remotely over the network. Once the agreed-upon policies are pushed out, the WIN-T Increment 2 network will automatically prioritize information according to precedence or category. Thus, mission-critical messages, such as 9-line medevac requests or calls for fire, receive higher priority. Vital information is delivered ahead of routine data.

This QoS, provided in part by a QoS edge device, is in addition to the standard QoS that is inherent in the current Internet Protocol Network.

EXTENDING THE NETWORK

The Soldier on the ground is the Army's greatest asset and is in many respects our most important sensor on the battlefield. Yet network users at echelons of company level and below have the greatest disadvantages.

There are myriad challenges in extending the network down to the lowest levels of the tactical formation. One of those challenges is to effectively provide satellite communications (SATCOM) down to these disconnected, geographically distributed lower echelons.

To help alleviate this particular issue, WIN-T Increment 2 introduces the Soldier Network Extension (SNE), which brings an initial SATCOM OTM



TACTICAL COMMUNICATIONS NODE

Soldiers work with a Tactical Communications Node at the WIN-T Increment 2 limited user test at Fort Lewis, WA. (U.S. Army photo courtesy of PEO C3T.)

SUPPORTING INTEROPERABILITY

Another particularly challenging problem today is joint and coalition interoperability. Interoperability within our systems and with joint and coalition forces is key to a successful network and is paramount to any successful mission within the constantly changing and evolving operational environment, as evidenced by the current fight.

The WIN-T Increment 2 architecture was designed to help combat part of this problem.

One specific configuration item, the Joint Gateway Node (JGN), enables legacy equipment, as well as joint and coalition partners, to plug into the network. The JGN is not just the perimeter information assurance protection boundary at the division layer and below. It is the plug-in point for joint and coalition forces, as well as organizations that are not organic to the Brigade Combat Team (BCT) or division

headquarters network and do not have a standard connection in the network

The JGN does not solve the joint and coalition interoperability problem completely, but it does provide a mechanism to allow that joint or coalition partner to plug in to the WIN-T network, and it is modular to allow lower-echelon Army units to serve in joint and coalition mission capacities.

CHALLENGES OF INTEGRATION

A unique characteristic of WIN-T is that for the Point of Presence and SNE, the kit must be integrated into the Modified Table of Organization and Equipment vehicle of that particular unit.

Integration into the Bradley family of vehicles, Stryker platforms, Mine Resistant Ambush Protected vehicles, and current and future wheeled vehicles is a joint engineering endeavor involving the WIN-T program office and the program

offices for the associated vehicle platforms. Together, we are developing integration kits for numerous platforms across infantry, heavy, and Stryker BCT vehicle types.

Integrating these capabilities onto platforms is not without its engineering challenges, including size, weight, power, cooling, and claim space.

It is also essential to make certain that all of the electronics and transmission systems to be placed on a vehicle can coexist and function without interference to existing weapon systems, while ensuring the safety of operators and maintainers. This is a team effort across multiple program managers and our industry partners.

CONCLUSION

There is, of course, a lot more to the WIN-T Increment 2 program. The cited examples are only a few of the configuration items and capabilities that will be made available to Army units starting in early 2012.

The current WIN-T Increment 1 network is the backbone of today's tactical Army, soon to have its first OTM enhancement as WIN-T Increment 2 rolls off the production line.

WIN-T Increment 2 is no longer just a plan in PowerPoint. It's real!

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