509TH SIGNAL BATTALION LAUNCHING NEXT GENERATION VOIP SYSTEM

By Todd C. Hunt

In July of 2012 the 509th Signal Battalion will launch a next-generation Voice over Internet Protocol system designed to provide Defense Switched Network dial tone services at the new U.S. Army installation on Dal Molin.

The $2.8 million IP telephony project is part of an effort to stand up world-class voice and data services for Army Europe's largest military construction project currently underway in Vicenza, Italy.

Located on the Northwest side of the city of Vicenza, the Dal Molin campus falls within the greater Vicenza Military Community. The $430 million green-field installation will be home for elements of the 173rd Airborne Brigade Combat Team and Headquarters U.S. Army Africa. Consolidation of the Airborne Brigade on Dal Molin in the spring of 2013 is expected to add 2,300 Soldiers to the Vicenza population.

With the Cisco Unified Call Manager enclave programmed for activation this summer, the battalion intends to have future Dal Molin customers fall in on a well-established, fully-accredited VoIP network.

The 509th Signal Battalion presently provides DSN services to more than 5,000 customers across Northern Italy and the Balkans. Current DSN architecture in the region includes a mature network of class-5 TDM end offices consisting primarily of Siemens EWSD and HiPath systems.

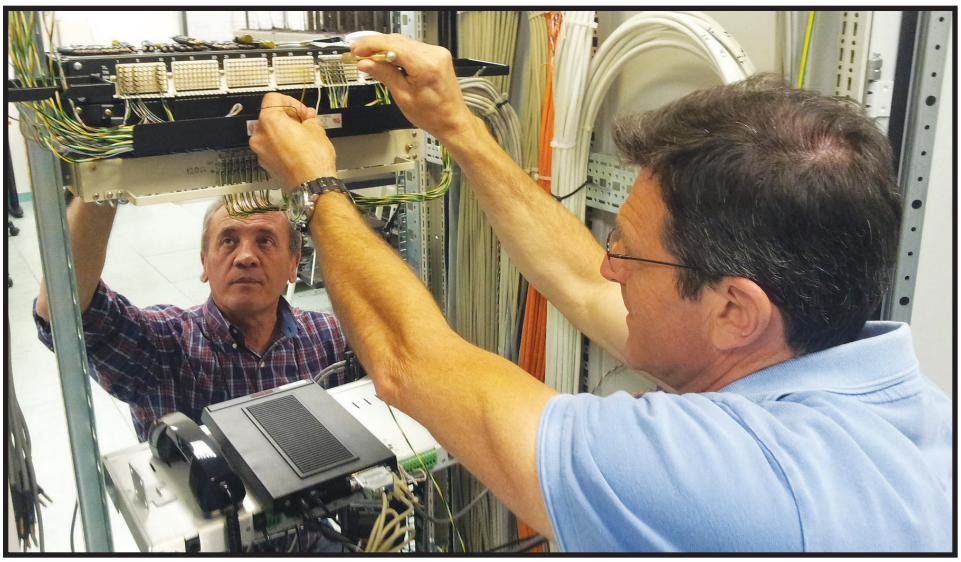
After nearly 10 years in operation, the highly-reliable Siemens systems have provided significant return on investment. Although similar TDM systems were initially considered for the Dal Molin campus, a business case to support further development of the legacy technology could not be established. Instead, designers opted to explore emergent IP-based solutions in an effort to reduce infrastructure cost and avail of an array of enhanced capabilities.

The decision to pursue a VoIP solution in Italy did not come without some controversy. With enterprise and theater Unified Communications initiatives in the initial planning stages and a HQDA CIO/G6 moratorium placed on standalone VoIP enclaves, the desire for IP telephony service on Dal Molin could not have come at a more inopportune time. Overarching UC programs did not sync with the Dal Molin implementation schedule and TDM-based systems were no longer available on the JITC approved products list. Unable to align end-state design criteria with the construction timeline, project managers were forced to consider interim solutions.

In November of 2009, provisional VoIP services were fielded for the construction offices on Dal Molin leveraging the Transportable Voice over Internet Protocol Switch, also known as TVIPS. In addition to its versatility the TVIPS had the advantage of a valid accreditation and fit the interim needs at Dal Molin without issue. This initial VoIP installment was sized to bridge the gap between the construction phase and the deployment of full-scale voice services.

Despite its limited capacity, TVIPS proved to be the right thing at the right time. In the two years following its activation services were extended beyond Dal Molin in support of contingency operations and to remote DSN users across the region.

With the provisional system firmly in place, the 5th Signal Command engineering staff was able to turn its attention to the planning of a permanent voice network solution for the new campus. Synchro



Raffaele Fusco *(left)* and Mirco Finco install T1 connections between the Electronic Worldwide Switch Digital switch and the Message Gateway Control Protocol routers.

Luciano Poli adds Cisco IP phones to the Cisco Unified Communications Manager database in preparation for the TVIPS user migration.

nizing efforts with the servicing signal battalion, the command developed a follow-on VoIP strategy that would scale into future enterprise and theater architectures.

In July of 2011, engineers completed installation of a PBX-1 CUCM enclave designed to provide high-availability VoIP services on the Dal Molin campus. Planned with future expansion in mind, the system was built with sufficient capacity to support all users across the 509th Signal Battalion footprint.

The initial VoIP implementation will provide capabilities similar to existing TDM systems with a few highly-desired enhancements. Augmented by Cisco's Unity Connection package, the Dal Molin VoIP enclave will offer voicemail as a baseline DSN service for the first time in the region. Other features distinguishing the follow-on VoIP system from its TDM predecessor include Extension Mobility, a web-based user interface, as well as enhanced Ad-Hoc and Meet-Me conference bridging.

As Dal Molin is integrated in the developing enterprise UC design, the door will be opened to the full range of converged network capabilities. Functionality such as Active Directory Integration, Unified Messaging and Global Directory services will fundamentally transform the basic VoIP network as USAREUR's southern flank is progressively incorporated in theater, enterprise and global UC architectures.

Users will be migrated to the Cisco Unified Communications Manager in three distinct stages beginning with the phase out of the provisional TVIPS system. The initial stage will transition more than 150 customers, dispersed across Italy and the Balkans, to the Cisco VoIP enclave. Phase two will integrate PBX-1 CUCM services across the Dal Molin, Caserma Ederle and Livorno campus area networks. In the final stage, the stand-alone VoIP enclave will be merged with the theater UC network followed by the migration of inter-site call routing from legacy PCM trunks to the IP cloud. To achieve this, the PBX-1 installation will be reconfigured as a LSC and AS-SIP trunks will be provisioned to Multi Function Soft Switches in the Central and Southern European region. The final stage will also include advancements to security with the realization of SRTP between all participating VoIP endpoints.

Customer and service provider alike anxiously await the ribbon cutting ceremony this July that will launch Army Europe's largest all-VoIP campus. This momentous event marks a giant leap from basic dial tone services to a highly-versatile converged voice and data network architecture. The long road to VoIP has led to the design of a solid Unified Communications foundation and the development of an incremental plan for expansion of services as enterprise initiatives mature. The collaborative efforts of the 5th Signal Command and 509th Signal Battalion teams have once again delivered a world-class technology solution to our war fighters in the Southern European region.

Todd Hunt, *a retired U.S. Air Force veteran, is a Department of the Army civilian serving as the chief of the 509th Signal Battalion's Network and Switch Division. He has over 28 years of experience in the communications and information technology arena with key assignments to NATO, Air Force Space Command and Headquarters 16th Air Force. His project portfolio includes contributions to the Defense Information System Network-Europe, Space Based Infrared System and U. S. Atomic Energy Detection System programs as well as an array of Global Information Grid test and evaluation initiatives.*

Acronym QuickScan

AS-SIP – Assured Services Session Initiation Protocol
CIO – Chief Information Officer
CUCM – Cisco Unified Communications Manager
DSN – Defense Switched Network
EWSD - Electronic Worldwide Switch Digital
HQDA – Headquarters Department of the Army
IP – Internet Protocol
JITC – Joint Interoperability Test Command
LSC – Local Session Controller
PBX-1 – Private Branch Exchange 1
PCM – Pulse Code Modulation
SRTP – Secure Real-time Transport Protocol
TDM – Time Division Multiplex
TVIPS – Transportable Voice over Internet Protocol Switch
UC – Unified Communications
UC – Unity Connection
USAREUR – United States Army Europe
VoIP – Voice over Internet Protocol