Miercom

Lab Testing Summary Report

March 2006
Report 060303

Product Category:
IP PBX High-End Systems

Vendor Tested:
NEC Unified Solutions, Inc.

Product Tested:
Univerge SV7000 Release 20.2.7

Miercom NETWORKS AS ADVERTISED™ Independent Lab Tested

The Univerge SV7000 achieved an overall score of 89 out of 100, based on Miercom's rigorous "High-End IP-PBX" methodology

Key Findings and Conclusions:

- **With the same "high-end IP PBX" testing applied in Miercom public reviews, the Univerge SV7000 met or exceeded industry ratings in all categories**
- **Security capabilities are solid and end-to-end, featuring Secure RTP encryption**
- **SIP is supported natively with clean and seamless interoperability with legacy equipment**
- **Performance in all measured areas –call-load handling, survivability and redundancy, and voice and connection quality – was exceptional.**

NEC Unified Solutions, Inc. engaged Miercom to independently review the latest release of the Univerge SV7000 IP-telephony system, using the same comprehensive test methodology that Miercom has applied to many other industry-leading "high-end IP PBXs" – systems supporting over 1,000 IP stations. Release 20.2.7 of the system, scheduled for availability in March 2006, was tested.

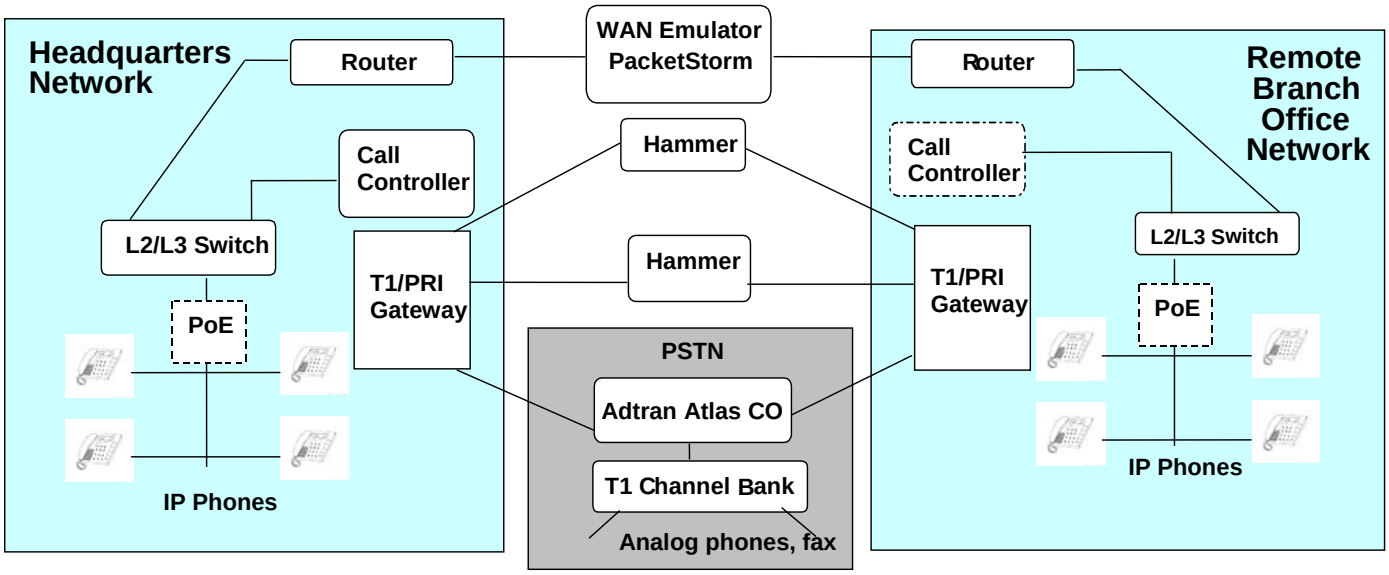
With above-average performance, the Univerge SV7000 passed all categories with flying colors, and was exceptional in the Architecture, Endpoints, Security and Performance categories. Miercom views the NEC system as one of the top IP-telephony systems in the enterprise marketplace.

The chart summarizes some of the more impressive, value-added features and capabilities exercised and validated in our testing.

NEC Univerge SV7000:
Verified, Value-Added Capabilities

Architecture	Native SIP support. Seamless interoperability with legacy gear and protocols. Excellent remote survivability. Dynamic resource allocation via vendor's Fusion architecture.
Endpoints	IP phones support color HTML display, and various useful add-on options, such as keyboard or mouse via USB port. OpenWorX Comm Portal provides conferencing, email access, presence.
Security	Verified encrypted call control, RTP streams, and secure management. Full encryption even of bridged conference calls.
Performance	Perfect call-load-handling (no call failures). Voice and connection quality garnered "excellent" (4.0+) MOS-equivalent ratings, even with considerable added latency, packet loss and jitter.

High End IP PBX Test bed Set-up



About the testing… Miercom's High End IP-PBX test bed consists of two "simulated" sites, a company headquarters and a "remote" branch office, connected by an IP-WAN link. At "headquarters" the network infrastructure included Extreme Summit 48 switches. The same network structure was deployed at the remote site. The two sites were also connected by T1 links through an Adtran Atlas 800 central-office switch simulator, this to test failover and re-routing scenarios. Fax support and other analog connectivity were also tested via a Carrier Access Corporation Access Bank II channel bank. Vendors provided their own PoE (Power over Ethernet) to power their IP hard phones. A PacketStorm Hurricane 1800E Network Emulator was used to simulate a typical IP LAN or "campus" environment, as well as a simulated IP WAN link over the Internet. For VoIP connection-quality tests this device applied latency, packet loss and jitter to simulate various call scenario environments.

All vendors' IP softphones were run on the same Compaq Presario 2500 laptop, and employing a Plantronics DSP-400 USB headset. Two Empirix Hammer Systems – a Hammer FX and a Hammer LoadBlaster 500 were used to generate the call loads required in the Performance tests. Various monitoring systems, including Ethereal, were used during the testing to verify network traffic and other VoIP operational characteristics.

Highlights: Among the more notable aspects of the NEC system, we believe, are: survivability, the CommPortal application, and SIP protocol and phone support.

Redundancy/failover/survivable call control. Testing found that fail-over from a primary to a redundant call controller occurs in 20 seconds. During and after this time established calls remain connected, and features including speed-dial and last-number redial also are retained.

NEC supports IP-to-PSTN failover with its Survivable Remote Media Gateway Controller (SR-MGC). IP-to-PSTN failover was shown to provide full alternate routing for new calls in 4.1 seconds after loss of IP-link connectivity.

Gateway survivability also works well. If a primary gateway fails, outbound calls to the PSTN are automatically handled instead by a back-up/secondary or hot-standby/redundant gateway. This automatic re-routing takes effect in less than 4 seconds.

CommPortal. The OpenWorX Communications Portal is an advanced presence-based communications management application suite delivering voice and video conferencing, as well as various other productivity-enhancing capabilities, to desktop users.

For multi-party video conferencing, Polycom video gear is supported, as well as most USB Web cameras. Up to eight simultaneous video endpoints are supported.

Some of the other key features and capabilities of CommPortal include:

- Rules-based routing, and find-me/follow-me
- Outlook integration

- Custom status (user-defined status messages)
- Whiteboard collaboration and screen sharing
- Text-to-speech (email read-out)
- Integrated mail client
- Personal directory (can import from MS Outlook) with name search and click-to-contact
- Corporate directory (LDAP-compatible with name search, click to call and status display)
- Call logs (date and time, click to call back)

CommPortal also offers the ability to add portlets to the client interface, which allows for single sign-on to various applications and resources.

The package features "presence," status-based call routing, away messages, and supports NEC's full-fledged Unified-Messaging package with voicemail and text-to-speech (email read-out), integrated with Outlook.

There are 25 free seats in the basic SV7000 system bundle.

MA4000. The MA4000 Management System is a strong addition to the overall solution. Single point of entry capabilities were simple to use and straightforward in their functionality.

SIP Support. The SV7000 "S" server handles SIP and ITN, or NEC SIP (which is SIP, plus NEC-proprietary PROTIMS extensions within SIP).

WiFi and many third-party devices all are based on SIP, and support a more limited feature set, compared to NEC devices, which also support NEC extensions atop SIP.

The SV7000 "S" Server is Linux-based, and handles all SIP protocol processing. The "S" Server provides expanded telephony registration, SIP functionality (standard and extended SIP), and Wi-Fi integration.

IP-PBX At A Glance

High-end IP-PBX, version tested:	**NEC Univerge SV7000, release 20.2.7.000**
Call controllers:	**SV7000 S and T servers: Proprietary real-time OS (T Server), and Linux (SIP-supporting S Server)**
Capacity	**40,000 BHCA; 4,000 IP endpoints. SV7000 has a 253 distributed-node network capacity (networked via NEC's Fusion call control signaling)**
Endpoints	**12 models of full-featured IP phones, plus** **• Softphone** **• Wireless IP phones**
Protocol Support	**Native SIP, also ITN (NEC "flavor" of SIP, adds extensions for NEC PROTIMS protocol)**
Security	**Secure call control,** **RTP encryption,** **Secure management access**
Featured application	**OpenWorX Communications Portal**

The Univerge SV7000 also supports Q-sig (via gateway), and an H.323 interface.

End-to-end encryption via NEC SIP (per RFC 3261) is supported throughout a distributed Univerge SV7000 system.

IP Phones NEC's SV7000 system supports alternative VoIP stacks, including: H.323, NEC extended SIP, SIP (per RFC 3261), and NEC Protims IP.

NEC also supports various 3rd party IP phones, including endpoints from:

- Cisco (via SIP),
- Polycom (analog and SIP), IP-500
- Grandstream (SIP), Model 100
- Ifone (via H.323 and SIP),
- Sipura (SIP)
- TigernetCom: IPPH 202B, and
- Wooksung: WVP-2100W

Conclusion

In Miercom's view, the Univerge SV7000 has proven to be a full-featured, SIP-enabled telephony system, coupled with a compelling productivity-enhancing application suite.

Awarded "NetWORKS as Advertised" Certification

Based on Miercom's thorough workout of this system, along with the examination of its capabilities, operation, and features, as described herein, Miercom hereby awards its "***NetWORKS as Advertised***" certification to NEC's Univerge SV7000, release 20.2.7. Notable among the features and capabilities verified:

- The system meets or exceeds the industry-average scores of all other IP-PBXs tested in all categories
- Performance in all measured areas – including call-load handling, survivability and redundancy – was exceptional. Voice and connection quality garnered "excellent" (4.0+) MOS-equivalent ratings, even with considerable added latency, packet loss and jitter.
- Security capabilities are extensive and end-to-end. IP phones support HTML display, and various useful add-on options. Various other features, including the OpenWorX Communications Portal, significantly add to this system's value proposition.

Univerge SV7000

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About Miercom's Product Testing Services…

With hundreds of its product-comparison analyses published over the years in such leading network trade periodicals as *Business Communications Review* and *Network World*, Miercom's reputation as the leading, independent product test center is unquestioned. Founded in 1988, the company has pioneered the comparative assessment of networking hardware and software, having developed methodologies for testing products from SAN switches to VoIP gateways and IP PBX's. Miercom's private test services include competitive product analyses, as well as individual product evaluations. Products submitted for review are typically evaluated under the "Net**WORKS** As Advertised™" program, in which networking-related products must endure a comprehensive, independent assessment of the products' usability and performance. Products that meet the appropriate criteria and performance levels receive the "Net**WORKS** As Advertised™" award and Miercom Labs' testimonial endorsement.

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