



Enabling Technology, People, and Business

Future Proofing Your Communication Platform

Optimizing your local area network for voice and data convergence while simplifying management - greatly reducing costs and requirements.

Are You Ready For a Paradigm Shift in Thinking?

“Simplicity is the ultimate sophistication.”

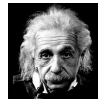
Leonardo Da Vinci

Optimizing For Convergence While Future Proofing Your Network; Ensuring Effectiveness While Simplifying Management

Knowledge is Power – An opportunity to save money while reducing stress for IT and telephony staff.

What if you could have voice quality-of-service regardless of data network loads, voice continuity regardless of network uptime, easy data network change management with no impact on voice delivery, stress-free IT management regardless of the real-time requirements of IP telephony and unified communications, and spend/allocate more of your budget on applications resulting in better return on investment. For those of us who understand the complexity of converged network, this sounds too good to be true. Good news - it's not too good to be true and thousands of users can verify it for you.

“We can't solve problems by using the same kind of thinking we used when we created them.”



Einstein

To get the most from this whitepaper you need to have:

- An open mind free of any biases
- Willingness to question why we accept complexity when there is a simple solution
- An understanding that disruptive, problem solving innovations are brought to market by new players and not the establishments who have legacy considerations driving their behavior
- Openness to a paradigm shift in thinking
- Strong drive to realize significant savings to your company and reduce the stress level of IT teams

Simplicity = Savings; Complexity = Cost + Dependencies.

Companies seek to gain the benefits of IP telephony and Unified Communications (UC) with the objective of saving money, improving productivity and enhancing customer service. Having an optimized converged network platform to address current and future communication needs are critically important to the overall success of the company. For IT decision makers and staff, the stress and complexities of managing a converged network have increased significantly due to the need to provide a platform that can effectively handle both the real-time requirements of voice in addition to ever changing data demands. Users accept waiting for a data file to open, but have zero tolerance when it comes to voice delivery and will not accept any delay or degradation in Quality of Service (QoS). This paper will focus on how customers can optimize the local area network for voice and data convergence while simplifying deployment and management and future proofing their network foundation.

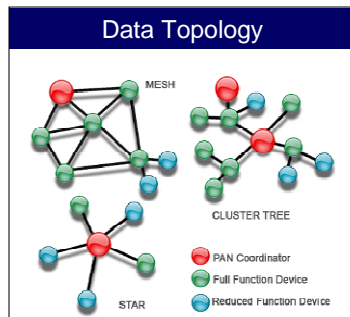
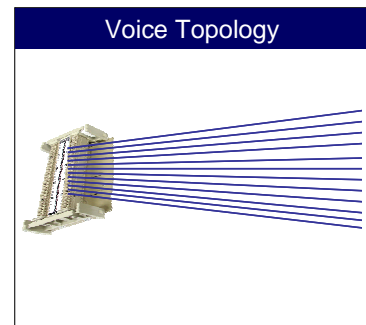
Until recently businesses did not have any options when it came to gaining the benefits of Unified Communications and IP telephony deployment. “Voice is simply another application on the network” was the mantra, resulting in the accepted standard of layering voice on the data network. The industry underestimated the requirements of having a distributed network that was built for data delivery, and assumed it would handle the real-time voice requirements as well. This methodology, driven not by the customer but the data switch industry, has proven to be the root cause of many of the complexities and stresses faced by IT decision makers and staff.

The good news is that you can gain the benefits of IP telephony without having to go through the pains of network complexities. You now have a choice that can result in either a simple or complex network topology. Remember simplicity = savings for your business and less stress for your IT staff, whereas complexity = higher costs for your business + more stress for your IT staff. To understand the choice between simple and complex converged network topologies we must understand how all this began.

The Beginning – Voice was clear and IT staff less stressed.

Prior to convergence, a business had two separate network topologies supporting communication requirements. The voice topology was specifically designed to deliver on the real-time voice requirements with a point-to-point topology standard across every location. This topology creates a physical dedicated path for every phone ensuring voice packets travel in order, on time and with no interference. A data topology on the other hand is distributed with no standardization. Any of the topologies highlighted below will work for business. This distributed topology came as a result of the network switch reach limitations.

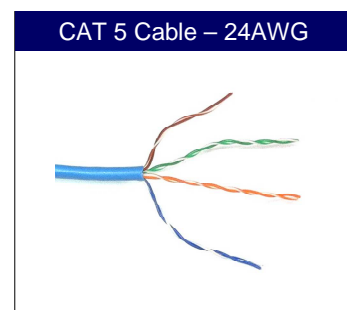
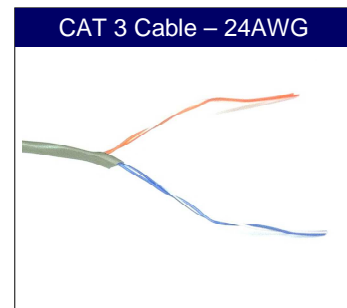
Businesses with many users create this web like topology which was acceptable for the near-time demands of data. Waiting for a data file to open is acceptable as packets are disassembled travel over the many switches and reassembled before being opened at the desktop. A one, two, or three second delay does not create alarm or concern about your network effectiveness.



Question: Simple or complex? Does it make sense that customers are forced to abandon a proven reliable point-to-point topology for voice and instead layer voice on a distributed data network that has no standard topology built specifically for the near-time requirements of data? Networking switch manufacturers created the methodology and paradigm without fully appreciating the complexities created for customers, IT staff and those who serve them.

Wiring – what’s the difference? Why does it matter?

The primary differences between Category 3 and Category 5 or higher is the number of twists per inch. The gauge of the wire (typically 24AWG) and the insulation of the wire are similar. Category 5 wiring has a greater number of twists which allows the cable to handle faster bandwidth – gigabit vs. 10/100. In the world of data and voice convergence we have opposing characteristics; data traffic travels in bursts therefore requiring larger bandwidth capabilities for quick delivery; voice on the other hand requires little bandwidth but is streaming, requiring bandwidth availability all the time with no disruptions. In the data world if bandwidth loads are strained the file simply takes longer to open, in the voice world packets get dropped and voice quality deteriorates. The industry fix for customers is to ensure that the pipe (bandwidth availability) is as large as possible to the desktop to reduce the risk of not having enough throughput availability for voice. This fix is based on working from a distributed topology mindset, where both voice and data requirements share one path, trying to support the real-time requirements of voice on a network built for near-time delivery. As a result businesses are often told that their cabling plant is inadequate for convergence and require changing.



Question: Simple or Complex? Is the cable plant of a company inadequate or is the methodology of layering voice on a data network creating the need for inflated bandwidth to mask the problem of reliably delivering on the real-time voice requirements?

Fact or Fiction – One Network, One Path is Better.

Initially the industry believed that “voice is simply another application” on a data network and great savings can be realized by having one network, one path. They greatly underestimated the challenges of having the data network handle the real-time requirements of voice and in fact created more complexity, more stress for IT staff and more cost as the dependencies on third party or internal expertise increased significantly. There are numerous studies highlighting the higher deployment and management costs for a converged voice and data network given this one network, one path topology. Take note of the number of booths for marketing network management software the next time you attend a tradeshow for unified communications or network convergence.

Question: Simple or Complex? Prior to layering voice onto a data network, was there a need for these expensive and complex network monitoring services or software?

Customers want UC Offering but they also want what they always had - but don't know to ask.

Many businesses are attracted to the business and financial benefits of having a Unified Communications platform. However they also expect what they always had from their voice experience. They want voice quality-of-service regardless of data network loads, they want reliable network with voice continuity even when the data network fails, and for the IT staff, they want a simple network to manage ensuring the effective delivery of both voice and data resulting in good user experiences driving the adoption of value added applications.

The most popular converged network deployment method is to have a computer daisy chained to an IP phone which is connected to the network. With this type of topology customers compromise on what they always had and voice quality of service is impacted by data network loads. There are no guarantees and if the data network goes down so will the voice, and for the IT staff, stress levels increase when users complain about voice quality issues.

“Because this is the way the industry told us we should do it”. Not a good answer for those who sign the Checks?

Remember, there was a time when it was common belief that the world was flat until this was proven wrong. Some took more convincing than others, but over time all were convinced. The network convergence paradigm of layering voice onto a data network with one path is a deep routed paradigm. All attempts at a solution like VLAN came from that way of thinking. For over a decade no firms have ever openly challenged the voice on data paradigm thus becoming the accepted standard despite the many documented challenges and complexities for both customers and those who serve them.

Question: Simple or Complex? Who had most to gain and who had most to lose if the paradigm was challenged and a simpler and effective method of network convergence was introduced earlier? The straight facts are that industry players who want to preserve their legacy investments and their dominant positions will do whatever it takes to maintain their advantage even when it doesn't best serve the customers needs. Customers, IT Decision Makers and IT Staff now have a choice.

Let's start from a customer objective back vs. from technology offer out perspective. – Would we create a better approach for customers? That's what Phybridge did and customers are better off for it.

The industry invented the methodology of layering voice on the data network to gain the benefits of IP telephony and Unified Communications with little empathy for customer requirements.

Let's take a fresh approach and see if we can give customers what they want (IP telephony and UC), always had (Quality of Service and a highly reliable voice experience). In addition, we can simplify their communication platform for today and into the future which will help IT and telephony staff deliver on the promises of unified communications and IP telephony. This will drive a better return on investment with a lower total cost of ownership.

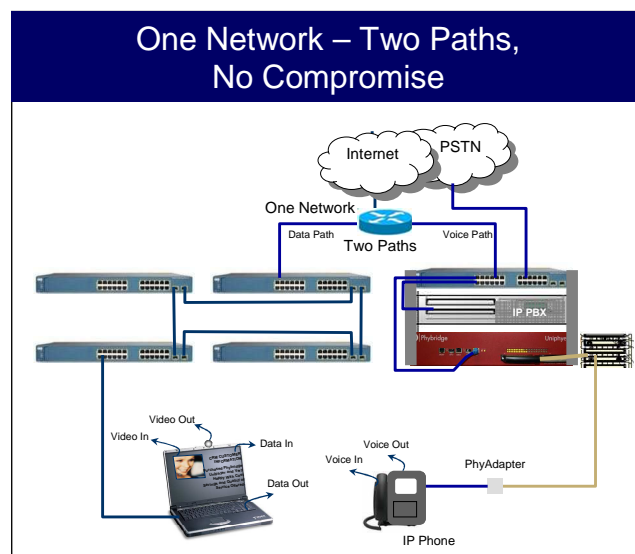
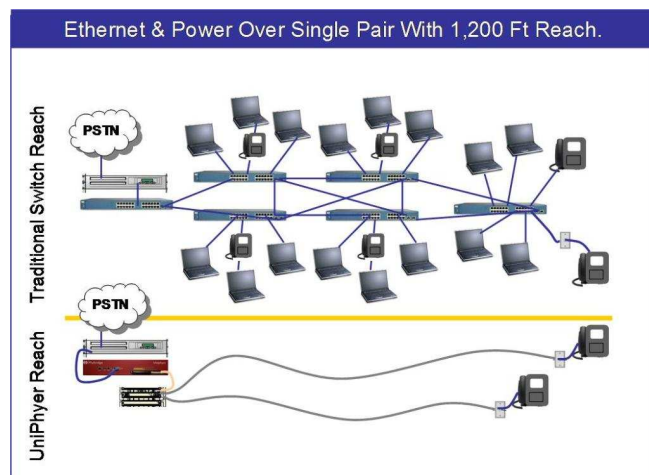
Are you ready and willing to accept a new paradigm? Remember to view things openly and ask yourself if the approach you are about to learn makes sense. Common sense leads to common savings especially when it comes to the complexities around business networks.

Simplicity is the Ultimate Sophistication.

Oliver Emmanuel, Founder of Phybridge and the inventor of the UniPhyer had significant first hand experience with networking challenges and requirements around voice and data convergence. He combined his experience with out of the box thinking, a belief in simplicity and a customer focused approach and customers looking to move to IP telephony are better for it. In 2009, Phybridge introduced the award winning UniPhyer that is solving many of the complexities around optimizing the LAN for convergence.

The foundational premise is based on *leveraging and not abandoning* the proven point-to-point topology of the voice infrastructure creating an IP network path complimenting and extending the existing data network while optimizing it for voice and data convergence. To do this a special network switch needed to be invented to deliver Ethernet beyond the 300 ft. and that power needed to be delivered over a single pair. The Phybridge UniPhyer was designed specifically to handle the real-time requirements of voice leveraging the existing proven point-to-point voice topology. **The UniPhyer is the only network switch to deliver Ethernet and Power over Ethernet over a single pair of wire with reach of 1,200 ft.**

The new, more customer-centric paradigm is having one network, two paths. The existing data path for data and IP enabled voice path by leveraging the existing voice infrastructure and

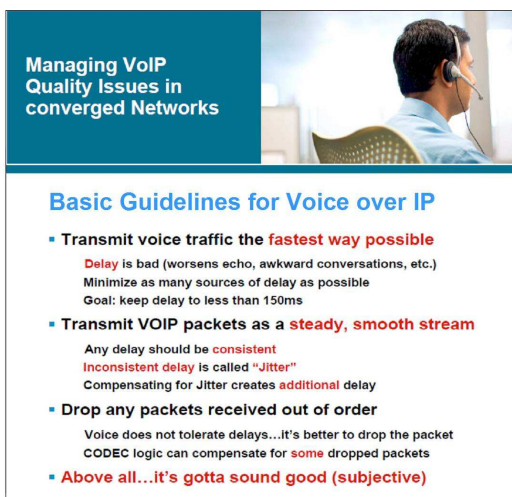


centrally converging. Converging Voice **with** Data is better than Converging Voice **on** Data and we have thousands of customers that agree. For those of you who are so deep routed in the old paradigm dealing with the day to day network challenges, the benefits claimed are unbelievable but true and can be verified including:

- Quick, easy, lower cost and risk free deployment with the same experience across every location regardless of size or data network readiness with a graceful migration option.
- Save Money: No need for costly network assessments, new cabling, rip and replacing data network switches, environmental considerations such as cooling and back-up power requirements for distributed closets.
- Optimized converged network ensures voice quality of service regardless of data network loads and voice continuity even when the data network fails and highly secure given the point-to-point topology.
- Stress free, easy to manage converged network with the separate physical path for voice greatly reducing day two management costs and the total cost of ownership.
- Approved with many of the leading vendors including Cisco, Avaya, Mitel, ShoreTel, NEC and many others.

A simple solution to the complex problem of ensuring voice quality on a data network.

Cisco, a leader in networking provides guidance on ensuring voice quality. Taking a deeper dive into each of



Managing VoIP Quality Issues in converged Networks

Basic Guidelines for Voice over IP

- **Transmit voice traffic the fastest way possible**
Delay is bad (worsens echo, awkward conversations, etc.)
Minimize as many sources of delay as possible
Goal: keep delay to less than 150ms
- **Transmit VOIP packets as a steady, smooth stream**
Any delay should be consistent
Inconsistent delay is called "Jitter"
Compensating for Jitter creates additional delay
- **Drop any packets received out of order**
Voice does not tolerate delays...it's better to drop the packet
CODEC logic can compensate for some dropped packets
- **Above all...it's gotta sound good (subjective)**

the recommendations highlighted in the slide you will find the point-to-point topology of a voice infrastructure provides an optimized foundation ensuring voice quality. No delay, no jitter, no echo, and no dropped packets given the dedicated physical path with no other devices sharing the bandwidth. Managing networks where every device, every application, and ever changing bandwidth requirements is complex enough on it's own without the real-time requirements of voice layered on it. Network management is greatly simplified when creating a separate physical path for voice coupled with leveraging the point-to-point topology of the voice infrastructure. Remember that voice bandwidth requirements are not significant – the key to quality is

the availability of bandwidth and with a UniPhyer back bone complimenting the distributed data network availability is guaranteed regardless of data network loads.

The UniPhyer is an enterprise grade network switch and provides many features including VLAN, remote management, spanning tree, enhanced security features. The UniPhyer along with your data switches can be integrated and easily managed through any of the SNMP management tools available.

Future proofing your network – Simplifying ongoing management, reducing total cost of ownership.

IT decision makers are always considering future business requirements when considering their networking gear. Let's look at how a UniPhyer back bone simplifies the ongoing management of the network.

Today the business driver change is voice and data convergence. This has been most effectively managed and optimized by using the UniPhyer back bone with all PoE requirements and voice quality assurance easily delivered. IT decision makers can move confidently to convergence with:

- Savings by extending the usefulness of their data network switches
- Simplifying deployment and back-up power requirements
- Eliminate risk with convergence level options from completely separate voice and data paths using the PSTN for voice connectivity for voice and Internet for data to fully converge with VLAN and SIP trunking. The customer is in control and business requirements can determine convergence levels vs. technology limitations forcing customer behavior
- No complex management software needed to be introduced for voice and data convergence given the physical separation simplifying and reducing stress for IT staff.
- More of the budget can be allocated to application adoption driving a better return on investment.
- Green solution which results in feeling good about leveraging proven wiring vs. ripping and replacing wiring and an acceptable network for data.

Tomorrow the business driver may be Gigabit to the desktop. If this becomes your business driver driven by increasing data traffic usage, gigabit to the desktop using the old method of layering voice on the data network would require a change to both the data network switches and to the IP phone to support the pass through data requirements. Did you know that the price delta between an IP phone and a Gigabit IP phone ranges from \$50 to over \$100 per phone? With a UniPhyer back bone you can make future changes with confidence:

- **Save money** by changing to Gigabit network switches with less or no PoE requirements given all PoE requirements are being supported by the UniPhyer back bone.
- **Save money and eliminate risk** by reducing the complexity and expertise required around change management knowing your voice path will not be impacted during data network upgrades.
- **Save money** by extending the usefulness of the IP phone. No need to change IP phone to support gigabit pass through requirements for data devices connected to the IP phone in a traditional daisy chain environment.

Next Year the business driver may be 10 Gigabit or wireless network to the desktop. Again this would be a function of increased data bandwidth requirements. Voice requirements will never change, constant stream of available bandwidth and power for the phone. Similar to previous experiences change management is simple yet most effective resulting in greater savings, no dependencies given the complexities - stress free change management.

Many networking players today will argue that using any other methodology other than layering voice on a data network is temporary. They have everything to lose; lost revenues in switch replacement, lost revenues in increasing maintenance cost due to complexity and dependencies, and losing their competitive advantage by combining their data gear with voice gear to drive more business. At Phybridge our mission is to help customers maximize their return on investment while reducing their total cost of ownership. We can only achieve this by having a robust and reliable solution solving complex problems in a simple yet effective manner. The Phybridge UniPhyer is an example of our mission in action.

Take the time, challenge the convergence paradigm and learn how you can join the growing number of satisfied customers realizing the tremendous benefits. The following page contains just a few of the overwhelmingly positive comments from many of our satisfied customers.

End User Testimonials

We have had no call quality issues since deployment and we are extremely pleased with the Phybridge UniPhyer."

IT Manager,
St John's Home

"The Phybridge enabled us to provide IP ACD Phones virtually anywhere on property which saved us staffing costs since I was able to take the ACD IP phones to the staff and not move the staff to the contact center for after hour coverage."

Brian Borucki
Marcus Corporation (Grand Geneva Resort)

"I initially deployed IP phones on the data network with many service issues. Discovered the Phybridge UniPhyer and the installation was slick, quick and professional. I was kept informed of the progress, tutored in the design and "how-to" grow on the system. Cutting over of the phones took mere seconds and I especially appreciated the backup plan that was put into place in the event of disruption. There have been no service complaints and I continue to be impressed with the ease of additional installations. An exciting and effective solution moving towards a VoIP environment."

Shaunna Kaminsky
Telecommunications Analyst
Mohawk College

"County of Dinwiddie, Va just installed your Phybridge solution with our new Avaya system and it work wonderfully!! We taught Avaya about your product...simple, but elegant! Great job."

Norman Cohen, County of Dinwiddie

Deployment Experience: "Loved it! Disconnect old phone install new phone. Simplicity is the key."

Norman Cohen, County of Dinwiddie

"We have put (ShoreTel) IP phones on the Phybridge UniPhyer and it works great!"

Chad Robinson
Director - Computer Services
Western State College

"I was skeptical, I didn't think the UniPhyer could deliver the smooth and painless installation promised by our VAR. However, having worked with the same VAR for more than 15 years I decided to trust them and I'm glad I did."

Michael McCarn, Director of Information Technology
American Institute for Cancer Research

"The ability to leverage the existing voice infrastructure to deploy our IP phones allowed us to use a repeatable, predictable process at every location. We have benefited with significant cost savings and reduced stress for our IT team. Without the UniPhyer this would not have been possible."

Tyler Hines
Information Technology
Prairie North Regional Health Authority (PNRHA)

"The UniPhyer installation was done in less time than expected and call quality is great with no support issues."

John Lau, IT Manager
Wasserman + Partners

"It enabled us to adopt a modern technology in a situation in which we wouldn't have been able to otherwise"

Jeanne Eicks, Director of Technology
Vermont Law School

"Without the UniPhyer this project would not have proceeded. There was no way that I was going to put my voice requirements on my data network. Too Risky."

Keven Matchett
Network Co-ordinator, Welded Tube of Canada

About Phybridge

Phybridge offers an industry leading voice quality guarantee available only through our certified partners. Voice quality on a UniPhyer backbone complimenting the existing data network will meet or exceed industry standards or your money back. In addition we are willing to offer qualifying customers a free proof of concept unit. Contact Phybridge at www.phybridge.com or call us at 888-901-3633 for more information.