

Planning:  
The Implementation Calendar



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Chapter 3

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The previous chapter went into detail about how to evaluate vendors and ask the right questions. This chapter will provide you with a high-level timeline for the implementation, from research to actual deployment.

## Planning: The Implementation Calendar



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## Roadmap to IP Telephony\*

12 Months	Read, Learn, and Ask (read about the technology, ask experts)
10 Months	Head for the Internet (scour vendor websites)
9 Months	Call in the Vendors
8 Months	Demonstration and Trial Period
7 Months	Gauge your Network's Readiness (assess what you have and what you need)
6 Months	Request Vendor Proposals
5 Months	Choose Vendor
4 Months	Prepare Your Network
1 Month	Pilot Installation and Testing
0 Days	Go Live

\*This schedule can be accelerated to fit needs. For instance, if your organization decides to move locations and the timing is right to implement VoIP, this schedule can be altered to fit a three month schedule.

## The Road to VoIP

### 12 Months to Deployment: Read, Learn, and Ask

The first step is research. The fact that you've reached this chapter in the book indicates you are fairly certain about deploying VoIP at least sometime in the future, if not the near future. It is best to be making that decision about 12 months before you want to deploy a new phone system, VoIP or otherwise. At this time, you'll want to get your hands on as much unbiased research and as many reports from reputable consultancies as possible. Read the research with the goal being to decide if VoIP is right for you. For now, pass up reports that talk about vendors, and get your hands instead on technology articles, technical papers, industry event presentations given by independent technologists or long-term experts, etc.

The following resources can be helpful in your search for VoIP information.

- CIO Magazine ([www.cio.com](http://www.cio.com))
- Network Computing (<http://www.networkcomputing.com>)
- Network World ([www.networkworld.com](http://www.networkworld.com))
- VoIP Magazine ([www.voip-magazine.com](http://www.voip-magazine.com))
- ComputerWorld ([www.computerworld.com](http://www.computerworld.com))

Trade magazines and their online counterparts do cover vendors, of course, but you can find unbiased technology primers and overviews. It's also helpful to read customer case studies about deployments to learn about the experiences of those companies that have deployed VoIP. Read case studies for technology tips first, vendor specifics second.

After you've searched on the Internet and leafed through your stack of technology publications, invest

in some time with industry experts and analysts. For lengthy conversations, you may have to invest more than time—research analysts can be hired on a project basis to provide you with valuable information and insights. But be sure to keep a keen ear out for biases because often analysts are paid consultants for specific vendors and because they know the vendor, they'll tend to reference them more often than others. Keep your questions, at this point, in reference to the technology. Learn all you can from these experts about organizations like your own that have deployed VoIP, what their specific challenges were, and what the results have been.

## **10 Months to Deployment: Head for the Internet**

After you've completed your technology research, visit the web sites of the vendors you've heard about. Read about offerings from the industry leaders Avaya, Cisco, Nortel and ShoreTel. Learn about smaller companies and what the benefits and drawbacks to their systems are. It's recommended to take and keep good notes so that by the time you're looking at the eighth vendor and you've forgotten which solutions do what, you'll have detailed notes to refer back to. This is where you want to establish a long list and then whittle it down to a short list.

You'll read about each solution with your own organization in mind. Jot down questions as you click through vendor web pages. You may get the answer to the question quickly, or it may remain on your list until you eventually meet with the vendor. If your organization has many offices across the United States, for instance, look at solution descriptions with scalability, flexibility, and ease of deployment mentioned early. If your organization rarely changes in size and has a limited number of telephony requirements, look for solutions that offer the basics at a very affordable price point.

Next, create a checklist or table with some common features. For instance, most VoIP solutions offer standard features like caller ID and three- or four-digit dialing. As you exhaust the common feature list, start adding unique features that matter to your organization. Learn (or try to learn) what differentiates each vendor you're considering. If you save the differentiation for the vendor presentation, you likely will get a skewed answer to the question, "What makes your solution different and superior?" This checklist is just the beginning and you won't do anything with it until the RFP phase.

Read articles about each vendor and mark items off your checklist as you determine what each offers. Start with articles that the vendor links to (usually found under headings like "press coverage," "news coverage," "case studies," "success stories," and "customer solutions" on the website). However, vendors obviously will only highlight their true success stories. Use an Internet search engine to do a little sleuthing yourself—you may find three or four stories about users' unhappiness with a certain vendor. Dig for the dirt. Use all of this information for your checklist and research notes.

## **9 Months to Deployment: Call in the Vendors**

After you've looked at your checklist and decided three or four vendors probably offer the best solutions for your organization, invite each of them to come in and give you an overview of their solutions and a demonstration if possible. You will hear a sales pitch, of course, but you may also hear features you hadn't learned about, or you may hear the names of customer references that have organizational needs like yours. Whenever a sales person drops a customer name, ask for the contact person to speak with after the vendor presentation. If you are told the customer cannot be a reference, (which is understandable—many companies will not speak as a customer reference by policy), ask for a similar customer that you can speak

with. If your organization is a bank with 23 branch offices, ask to speak with a similarly sized bank reference. If the vendor is not able to give you even one customer reference right away, take note and be cautious.

## 8 Months to Deployment: Demonstration and Trial Period

After you've seen each vendor's presentation (and possibly after you've spoken with customer references), inquire about an onsite demonstration and also a trial period. Some vendors, after they've shown you how their system works, are willing to deploy a sample set-up so you can test the solution in your office. Some vendors give you just a few days or a week. Often, as the trial period nears the end, you can easily get an extension just by asking. A reputable vendor does not put a deadline on your decision. They want you to be happy with your choice of their solution; an extended trial period is not a huge cost to them.

### Crucial Tasks - Do Not Skip

- Talk to multiple customer references: insist on recent customers as well as success stories.
- Get each vendor to bring an RFP into your office, in person, to discuss details.
- Talk to colleagues at other organizations that have deployed VoIP (beyond vendor references).
- When you're close to choosing vendor, obtain equipment for a trial period.

## 7 Months to Deployment: Gauge your Network's Readiness

In order to achieve toll-quality voice, you need to deploy VoIP over a properly architected network infrastructure—i.e., it has to provide sufficient throughput and meet latency, jitter and packet loss requirements.

**Throughput:** How much bandwidth you need depends on the how many simultaneous calls your organization has going on, the voice encoding scheme used in the IP handset or soft phone, and the signaling overhead.

**Latency and Jitter:** Latency is the time it takes for a caller's voice to be transported (packetized, sent over the network, de-packetized, replayed) to the other individual. Distance and lower-speed circuits can cause delay. Latency that's too high interrupts the natural conversation flow (you may have spoken with someone using VoIP—you think they have stopped talking but they haven't—that's latency). Latency cannot exceed 100 milliseconds one way for toll-quality voice. Acceptable quality voice can go up to 150 milliseconds and participants can still carry on a decent conversation.

**Packet Loss:** Packet loss results in a metallic sound or conversation dropouts. It's caused by congestion, distance and poor line quality. Because IP telephony is a real-time audio service using Real Time Protocol (RTP) running over User Datagram Protocol (UDP), there's no way to recover lost packets. A mere one or two percent packet drop degrades voice quality.

## 6 Months to Deployment: Request Vendor Proposals

If you work with a network integration partner or consultancy, you may want to call on them to help you with the Request for Proposal (RFP). You may also request a sample RFP from any of the vendors you'll be evaluating, but make sure the one you use is comprehensive and not skewed toward any one vendor. If you decide to write the RFP yourself, chapter 2 of this book includes an outline on how to go about it.

The next step, after issuing the RFP is to closely review the proposals from each vendor. It will be helpful to use a weighted ranking system to score each vendor based on your long list of requirements. Again, see chapter 2 for ideas about creating these checklists and spreadsheets. After you've narrowed down the vendors to a short list, ask to see a demo and request a sample set-up to test the solution in your office. Most vendors will give you a free trial period so you can get more comfortable with the system.

Once you've collected all of the information and carefully evaluated your short list of vendors, think carefully about your organization's priorities in general and start talking to customers. Be sure you get customer references that have similar networks and similar business requirements to your own organization. Again, ask to speak with recent customers: It's easy to give you a list of happy customers. Ask for a list of the most recent customers signed on—within the last three months, for instance—and call them about their experience.

## 5 Months to Deployment: Choose Vendor

After you've taken all these steps, created a feature checklist, and determined which vendor best meets your feature/functionality requirements, you should be ready to make the decision. Be sure and ask any remaining questions before you indicate that you are leaning towards that vendor. It is very important to review the vendor's website, including where they post press releases. If there have been any recent upgrades or new product announcements, ask how customers are responding and call customer references again. This will give you the freshest input, and you'll be able to make the most educated decision on the right vendor for you.

## 4 Months to Deployment: Prepare Your Network

Assessing your current network is crucial to a successful VoIP deployment. There are a number of things to keep in mind and questions you'll want to answer about the organization's telephone usage. The following checklist will help ensure you think of everything.

1. Determine your business requirements. How will the system be used? How many calls per month (or day) are made out of your office? Are those calls to customers or internal employees? How many offices will you have on a system? Are there remote offices to consider?
2. Look at your LAN. What equipment are you using? Do you have an up-to-date network diagram? Is the equipment current or outdated? Are you using Virtual LANs (VLANs) for security or performance issues? VLANs improve voice quality by prioritizing voice traffic.
3. Assess your WAN. How much WAN bandwidth do you have between offices? How much will it need to increase or decrease to support VoIP based on the number of voice calls per month you've determined? How many home or remote offices do you have and will you need dedicated circuits or will DSL suffice? Consider whether managed IP services are a fit for your organization as an alternative to traditional dedicated circuits.

4. Start using quality of service (QoS) on your network to prioritize voice traffic over less delay-sensitive traffic (to avoid voice degradation when large data transfers are taking place). The type of QoS you implement depends on what your routers and the IP telephony system can support. Most routers can translate the appropriate Layer 2 QoS information into Layer 3 QoS, but you'll need to make sure your router can handle this at wirespeed.
5. Discuss negotiating service level agreement (SLA) with your WAN service provider to provide guarantees of throughput, availability, latency, jitter and packet loss. Providers are starting to offer increasingly complex SLAs in order to win and keep business. When it comes to remote offices, ask your provider about its partners that will support the SLAs.
6. Conduct a thorough network assessment. Use specific network assessment services or tools to thoroughly measure your network's readiness for VoIP. You must get a detailed overview of your network's performance right to your users' desktops. By looking for pitfalls, you'll further guarantee deployment success.
7. Finally, beware of virtual private networks (VPNs). Many organizations use VPNs for secure remote access, but encryption adds overhead to user sessions. While most VPN hardware appliances do not increase latency, software VPNs do.

## Network Assessment Tools and Services

There are numerous tools available to gauge your WAN infrastructure to ensure it is voice-ready. These tools measure latency, throughput, packet loss, jitter, and out of order packet delivery. They deliver a score based on how your current infrastructure will handle a given number of voice calls as it stands currently.

Some of the items you'll consider include:

Sites	Number of sites in your organization
Bandwidth	Bits per second (bps), or CIR if frame relay
Codec	G.711, G.729
Max calls	Maximum expected number of concurrent calls across the link
QoS	How is network configured to prioritize voice packets over data packets?

Once you've gotten your network score, you'll make necessary changes to ensure all your organization's voice calls are successfully handled. For instance, if the test determines you have packet loss or latency between site A and B, you may decide to initiate a private WAN. Or you may change your bandwidth dedication and QoS parameters to ensure voice packets get through.

Some tools on the market include:

Viola NetAlly

NetIQ AppManager Suite

Computer Associates Unicenter Management Suite

NetScout nGenius

Freeware is also available from companies like AdventNet, Nessoft, and others.

## **1 Month to Deployment: Pilot Installation and Testing**

If you have an integration partner or the vendor you have selected works with regional resellers and consultants, call and schedule a time to determine your needs list. If your organization or the vendor does not have an integration partner, get an engineer from the vendor in to help you with this list. With this person (or people), look closely at the current design of your network and make a list of any equipment upgrades or new purchases you'll need to make in order to optimize the infrastructure for VoIP. Again, use specific network assessment services or tools to thoroughly measure your network's readiness for VoIP (throughput, latency, jitter, packet loss).

Once the original network assessment is made, update any existing network diagrams you'll be using. Be sure to label it so you know it is the original (pre-VoIP). Next, sketch your new network diagram with the VoIP gear included. Determine if there is any overlap and if perhaps you don't need as many switches as you thought. If you're not working with an integration partner, you may want to invest some money in having a technology expert take a look at your new proposed network diagram. It's better to make major changes in the planning stage as opposed to after you've taken delivery of your VoIP equipment. An expert can also make sure you maximize your equipment purchase and may make modifications to your diagram that will save you money in the long run.

After you've come up with your new network diagram, begin deploying the gear onto a test network. This will not only help ensure the new system works optimally, it will help you get accustomed to the new equipment so other deployments (to other locations, for instance) go smoothly. At the beginning, the test network should not affect anybody's workday. During the second phase, transition some non-critical employees or departments to the test network. This will help you further test the system in a real-world scenario and also gets users familiar with it.

## **0 Days to Deployment: Go Live**

After you have played with the system for a few weeks or months and made appropriate configuration changes to adapt to your entire organization, begin rolling out VoIP company wide. An installation in phases tends to work best, even if the phases are over one week. The larger your enterprise, the longer it will take and the longer you may need between phases.

After the rollout, it's imperative that you schedule end user training. You may handle this by department or location, depending on your organization. Vendor representatives are often available to be onsite to provide expertise and demonstrations during end user training sessions. While your choice of solutions will likely be rich in features, these features should also be intuitive to the end user; therefore training should take just two or three hours, as opposed to all day.

Make sure that the team you've put together is available for the duration (right through user training), at least on some level. If you've chosen a project leader, this is the person who will know all the details, even if he or she is not working daily on all of them. Once you've made the switch, so to speak, sit back and start enjoying the benefits of VoIP.

## The Bottom Line

You want to take your time implement VoIP. A year may seem like a long time, but the more time you invest up front, the less money you're likely to waste overall. However, if you do not have a full year, this schedule can absolutely be accelerated—but do not skip steps, just shorten each cycle to fit your needs. The next chapter will go into more detail about reliability and what's required in order to ensure maximum uptime. Topics to be covered include redundancy, mean time to repair (MTTR), mean time between failures (MTBF), and network and applications reliability.