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Top 10 Mistakes Deploying and Upgrading Lync Server 2013

Top 10 Mistakes Deploying and Upgrading Lync Server 2013

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Introduction

This white paper addresses the top problems when trying to deploy Microsoft Lync Server 2013 into a production environment and how to resolve the issues before they prevent product implementation or lower workplace productivity.

As a technician, it is a key responsibility to perform due diligence to ensure our company/client receives the product that they are expecting within the appropriate budgets we have been allotted. Being proactive can help eliminate these issues before they arise, whereby allowing us to deliver a fully supported and functioning Microsoft product to our organization.

1. **Ask the correct questions to determine the business drivers for the deployment:**
   Why are we deploying Lync Server 2013? Is it for new features? To replace an old PBX solution? Make sure everyone is on the same page as to why the new solution is being implemented.

When a company first decides to move to a new unified communication platform, there has to be reasons behind the decision to deploy Lync Server 2013. Business drivers are the reasoning behind this decision, which may include:

- The company would like an online or hybrid deployment.
- The organization would like to use conferencing capabilities and invite internal and external users.
- Remote, work-from-home, or traveling users need full communication capabilities as if they were in the office.
- High availability and disaster recovery are now required per company policies.
- Desktop sharing capabilities will be a new tool used for the helpdesk to troubleshoot issues.

Business drivers may also come in the form of questions. It is important to ask the correct questions as they should help you arrive at justifiable solution statements that will determine the type of solution and its features you would like to implement and, above all, why. For example:

Problem: Travel costs are getting out of control. Excess travel spending is decreasing our bottom line.

Q: "How can we cut costs of travel and still have business meetings with our clients on a regular basis?"

A: "Lync Server 2013 can deliver multiple types of audio and video conferencing and data collaboration methods for sales presentations to external clients without having the sales team travel to multiple locations, thereby cutting travel costs."

Business drivers should come from all parts of the company; from upper management, to secretaries and mailroom staff, and to the IT staff. Everyone uses the production systems in different ways. Getting as much input as possible will give a better scope of the desired capabilities of a solution that you are looking to implement.

After the business drivers have been determined, make sure that all stakeholders involved support the new solution. If even one person does not believe that the solution is not what is truly desired, then the implementation's success may be minimized.

At this stage, business drivers can now be converted to technical requirements that affect design decisions. This is the point where we take the logical ideas behind why we want to do something and apply it to the Lync Server 2013 design using tools such as the Microsoft Lync Server 2013 Planning tool. At this point, you will take your business drivers and turn them into a logical design for your company.

2. **Utilize all the tools available for infrastructure planning:**
    There are a large number of tools made available from Microsoft that are under-utilized by IT professionals. The Microsoft Lync Server 2013 Hardware Capacity planner, Microsoft Lync Server 2013 Bandwidth calculator, RASK are all free an available from Microsoft to assist you with a successful deployment.

One of the keys to implementing a successful Lync Server 2013 solution is planning the necessary infrastructure to support the features and specifications that meet your logical design. Without doing the necessary mathematical computations for bandwidth, server capacity, budgeting, and project rollout deadlines, a Lync Server 2013 solution will not implement successfully. The after effects will linger throughout your organization causing more problems in the future, thereby making your job and possibly the jobs of others much more difficult.

How can we eliminate these issues proactively? The key is utilizing tools that we sometimes take for granted. There are a number of free tools from Microsoft that help us estimate the computations for bandwidth and hardware capacity needed for Microsoft Lync Server 2013 to operate efficiently. Some of these tools include:

- Microsoft Lync Server 2013 Planning Tool
- Microsoft Lync Server 2013 Hardware Capacity Calculator
- Microsoft Lync Server 2013 Bandwidth Calculator
- Microsoft Lync Server 2013 Rollout Adoption and Success Kit

These tools do add more overhead time to a project during the planning phase, but they can save you a lot of time later because we have taken a proactive stance on our production environment requirements for Lync. Let's go through these tools one at a time to clarify how we can benefit.

The Microsoft Lync Server 2013 Planning tool

This tool will ask you specific questions about the roles and features you would like to deploy in your environment. Not only will this tool help you plan for the necessary number of servers for each Lync site, but will give you reports and Visio diagrams for firewalls, certificates, and DNS entries. These reports will save a lot of time for IT staff to compile and implement the necessary changes in your current environment. The Lync Server 2013 Planning Tool can be downloaded here: http://www.microsoft.com/en-us/download/details.aspx?id=36823.

Microsoft Lync Server 2013 Capacity Calculator

This is designed to assist you in determining server requirements based on numbers of users and communication features that are enabled at your organization. You enter your organization's profile, and the calculator provides recommendations that help you plan your topology. You can benefit most from the calculator if you have accurate, detailed information about your specific user profile. For example, the percentage of voice-enabled users, average calls per user per hour, call duration, and the percentage of concurrent users in conferences can make a huge difference in server requirements.

To calculate the capacity requirements, you must enter data pertaining to Instant Messaging and Presence, Enterprise Voice, Conferencing, and Mobility. These values will then show recommendations for total number of front end servers, edge servers, archiving/CDR/QOE stores, and backend database server requirements. There also will be values for average CPU load, required bandwidth allocation, and memory requirements. The Lync Server 2013 Capacity Calculator can be downloaded here: http://www.microsoft.com/en-us/download/details.aspx?id=36828.

Microsoft Lync Server 2013 Bandwidth Calculator

With the Lync Server 2013 Bandwidth Calculator, you can enter information about your users and the Lync features that you want to deploy, and the calculator will determine bandwidth requirements for the WAN that connects sites in your deployment. Without these calculations, any branch offices with a WAN connection can run low on bandwidth thereby preventing calls, conferences, or other Lync functionality. Also, third-party applications requiring use of the WAN may experience difficulty or connection loss. The Lync Server 2013 Bandwidth Calculator can be downloaded here: http://www.microsoft.com/en-us/download/details.aspx?id=19011.

Microsoft Lync Server 2013 Rollout Adoption and Success Kit (RASK)

I have had this tool described to me as "No more than a Lync-specific, over-glorified project management tool." Now, I could see that perspective, but I had to correct that statement as "Actually, it focuses on the organizational readiness, change management, and user experience aspects of your Lync Server 2013 rollout."

Microsoft explains RASK as: "The Lync Rollout and Adoption Success Kit (RASK) is designed to help you achieve rapid, sustained adoption of Lync Server 2013 and long-term operational success. It focuses on the organizational readiness, change management, and user experience aspects of your Lync Server 2013 rollout... RASK is organized into 3 core components: *Rollout phases, Readiness focus areas*, and the *Deployment readiness report*. Together, these components create a flexible framework that is easy to customize according to the unique characteristics of your organization, and that is relevant to deployments of almost any size or complexity."[1]

In my experience, what I found this tool brings to the table is a centralized area where I can combine my project scope, proof of concept, pilot rollout validation, enterprise rollout validation, and finally, run state. This tool can ultimately verify if you are ready to roll out Lync Server 2013 and how the adoption of Lync within your company has been viewed and implemented. The RASK can be downloaded here: http://technet.microsoft.com/en-us/lync/jj879331.aspx.

3. **Supporting multiple Operating Systems and Clients:**
   Lync Server 2013 is supported for both Microsoft and Mac Operating systems. Make sure if you are deploying to both platforms, you can support issues on either OS.

The first thing to recognize is which operating systems are supported with Lync Server 2013. It is important to remember that Windows XP and Windows Vista are no longer supported with Lync Server 2013 clients.

Lync Server 2013 supports the 64-bit editions of the following operating systems:

- The Windows Server 2008 R2 with Service Pack 1 (SP1) Standard operating system (required) or latest service pack (recommended)
- The Windows Server 2008 R2 with SP1 Enterprise operating system (required) or latest service pack (recommended)
- The Windows Server 2008 R2 with SP1 Datacenter operating system (required) or latest service pack (recommended)
- The Windows Server 2012 Standard operating system

- The Windows Server 2012 Datacenter operating system
- The Windows Server 2012 R2 operating systems are supported with the Cumulative Updates for Lync Server 2013: October 2013.
- The Windows 7 operating system with SP1 operating system (required) or latest service pack (recommended)
- The Windows 8 operating or latest service pack (recommended)

Lync Server 2013 is not supported on the following:
- The Server Core installation option of Windows Server 2008 R2 or Windows Server 2012
- The Windows Web Server 2008 R2 operating system or the Windows Web Server 2012 operating system
- Windows Server 2008 R2 HPC Edition or Windows Server 2012 HPC Edition
- Windows XP with any service pack
- Windows Vista with any service pack

Lync Server 2013 is available only for Windows. However, Lync Server 2013 supports the following clients on computers that are running Mac OS 10.5.8 or latest service pack or release (Intel-based) operating systems (Mac OS 10.9 is not currently supported).
- Microsoft Lync for Mac 2011
- Microsoft Communicator for Mac 2011

For those of you with a mixed desktop platform environment, you will be supporting both Mac and Windows. Here are some helpful tips to help you support such an environment:

A. If you are pulled in multiple directions because of lack of IT resources, then create a list of common Q&A with instructions on how to resolve an issue on a company intranet so users may be able to answer their own questions.

B. If your skills are not balanced out between both operating systems, work with the one you know the least. Being primarily around something new can help you learn it more quickly.

C. For larger environments, it may be justifiable to bring on another resource to help support the OS you are not as familiar with. Adding another resource can help free up your time to work on other issues that require your attention.

4. **Reusing unsupported equipment from a previous installation**
Just because equipment is fairly new and is "vendor supported" for Lync Server 2013 does not mean it is supported by Microsoft. Do your homework to ensure your solution is supported by Microsoft.

Organizations are always trying to save money when deploying or upgrading a product in a production environment. When trying to save money, corners are cut on both equipment costs and overhead hours. A common mistake is to repurpose old equipment that may not meet hardware requirements for Lync Server 2013. As beneficial as it may seem to reuse equipment, this can land you in some hot water if the equipment is not Microsoft certified for Lync Server 2013. Equipment that is most often reused includes reverse proxy solutions, such as Microsoft Threat Management Gateway (TMG), PSTN Gateways, IP-PBXs, Survivable Branch Appliances (SBAs), Load Balancers, and IP desk phones.

In order for Microsoft to support your Lync solution in the event of a failure or to help with troubleshooting, all specifications of equipment and topology must be in compliance with Microsoft guidelines. If it is not, Microsoft will decline support based on your current solution.

A common misconception is that since a device worked with a previous Lync solution, it will work with Lync Server 2013. Some devices may work with the new solution and may be "Vendor supported" for Lync Server 2013. Do not assume that this means that they are "Microsoft supported." Vendors may even go to such lengths of saying that are going to be Microsoft certified soon. Remember, this will not help you when asking for help with Microsoft before they have been certified. Either it is Microsoft supported or it is not Microsoft Supported.

To ensure your Lync solution is in compliance, you need to verify that your devices are on the list of Lync Server 2013 qualified devices.

- For infrastructure qualified devices, go to:
  http://technet.microsoft.com/en-us/lync/gg131938

- For IP desk phones and other audio and video devices qualified for Microsoft Lync, go to:
  http://technet.microsoft.com/en-us/lync/gg278164.aspx

Device compliance should be done during the planning stage of your implementation to ensure if any new equipment needs to be purchased, ordered, and within your budget. This is important to guarantee a successful and orderly rollout of Lync Server 2013.

5. **Don't know how to script using PowerShell? That's ok!**
   PowerShell is a relatively new administrative interface that can be used for system administration, automation, and scripting within Microsoft operating systems and applications. Knowing PowerShell can save you time and effort when working with Microsoft Lync Server 2013.

One benefit the Internet has brought us is loads of information from all over the world. For IT professionals, the biggest benefit is the sharing of our experiences with ways to make things easier. PowerShell is still new to a lot of IT professionals. On one hand, someone may take a class on Windows PowerShell 3.0 to learn about all of the aspects of cmdlets (pronounced "command-lets), piping, and scripting. You become familiar with all the tools and cmdlets that are involved with PowerShell. It also helps reinforce a skillset that can be used in other aspects on PowerShell scripting such as Microsoft Exchange or Server 2008 R2/2012/2012 R2.

On the other hand, budget constraints or availability can also determine whether or not a class can be scheduled. If we are looking for something specific, a quick Internet search can yield the correct cmdlet or script, as long as we know what we are looking for.

There are a vast amount of websites that can direct us to pre-created scripts to assist with common Lync functionality and configuration. Of course, one must take the scripts with a grain of salt. Some scripts may need some editing to reflect your production environment. Also, any untested script may fail or possibly corrupt your environment.

With some basic Internet searching and reviewing of website comments, IT Professionals can learn which sites hold valuable and, more importantly, correct scripts. However, in order to determine if scripts work correctly, they should be tested in a non-production environment. They should also be reviewed for context and ensure they do not send information outside of your environment.

To get you started, here are some scripting resources that I have found to be very useful:

- **Lync Server 2013 built-in scripts**
  Microsoft provides applications, executables, batch files, and PowerShell scripts built into the Lync Server 2013 installation. The default location for these files are:

  C:\Program Files\Common Files\Microsoft Lync Server 2013

- **Lync TechCenter**
  Provides many useful scripts tested by Microsoft
  http://gallery.technet.microsoft.com/lync/site/search?f%5B0%5D.Type=RootCategory&f%5B0%5D.Value=lync&f%5B0%5D.Text=Lync

- **EHLOWorld**
  A Lync and Exchange resource website created by Pat Richard that includes scripts, customization tips, and technology reviews. You will find useful scripts such as Set-Cs2013Features.ps1 v2.2, which installs the prerequisites and many additional features, configurations, and add-ons for Lync Server 2013.
  http://www.ehloworld.com/tag/lync-server-2013
  http://www.ehloworld.com/scripts

6. **Utilizing an in-house VPN connection**
   VPN solutions have their place in an organization, but not for securing Lync connections. Know when and how to utilize VPNs alongside of Lync Server 2013.

Many organizations utilize Virtual Private Networks (VPNs) to secure traffic when users are outside the corporate network. VPNs have numerous security benefits, but they can actually degrade the call experience for Microsoft Lync users. This occurs because Lync traffic is already secured. When users connect to the corporate network using a VPN client, Lync media traffic is sent through the VPN tunnel. This solution can create additional latency and jitter because media traffic must pass through an additional layer of encryption and decryption.
The solution is to force Lync traffic around the client VPN, while allowing users to connect to other internal company resources.

A. **Establish a split-tunnel VPN solution.**

A split-tunnel is a VPN connection that allows connections intended for internal resources to traverse the VPN. All other user requests are sent through an Internet connection and bypass the corporate network. It is critical that all public IP addresses used for the Lync and Exchange environments are excluded from entering the VPN tunnel.

Please consult your VPN appliance vendors' documentation for more information.

Administrators can create a custom Windows Firewall rule set to prevent Lync client traffic from entering the VPN.

Source	Destination	Port	Firewall Profile	Description
Client VPN Subnets	Corporate VPN network	1024-65535 TCP/UDP (this is by default; however these port ranges are configurable)	Domain	Lync Server 2013 client media traffic to all other internal clients.
Client VPN Subnets	All Lync Servers, including the Edge Server internal interface	All Ports TCP/UDP	Domain	Lync Server 2013 client traffic to Lync Servers, all should be blocked.

B. **Resolve external DNS entries for the Lync Edge services, Lync Web services, and Exchange Web Services.**

You must use a dedicated DNS server with pin point zones to resolve public IP addresses in response to queries from the Lync client.

You need to provide the public IP addresses back for those queries:

- Lync Edge Server services (Access Edge, Web Conferencing Edge, and Audio/Video Edge)
- Simple URLs (reachable through the reverse proxy)
- Exchange Web Services (EWS), Autodiscover service and all other client connectivity

Record	Resolves to	Description
Sip.sipdomain.com	XXX.XXX.XXX.1	Access Edge interface
_sip._tls.contoso.com	Sip.sipdomain.com:443	Auto Login SRV record for clients
Web.sipdomain.com	XXX.XXX.XXX.2	Web Conferencing Edge Server
Av.sipdomain.com	XXX.XXX.XXX.3	A/V Edge Server
Web-external.sipdomain.com	XXX.XXX.XXX.4	Pool external web services
Meet.sipdomain.com	XXX.XXX.XXX.4	Meeting join page
Dialin.sipdomain.com	XXX.XXX.XXX.4	Dial-In conferencing settings page
autodiscover.sipdomain.com	XXX.XXX.XXX.5	Exchange Auto Discover
owa.sipdomain.com	XXX.XXX.XXX.5	Exchange Web Services/Outlook Web Access

C. **Register through the Lync Access Edge service.**

To force the Lync client traffic around the VPN, the public IP addresses for all three Edge services must be returned to the Lync client when it makes a query. This allows the Lync client to connect to the Access Edge as an external client. This is required because users must register as external to obtain proper Media Relay Authentication Server (MRAS) credentials.

a. Block connectivity from VPN connected Lync Server 2013 clients to all Lync Servers and all internal client subnets through the VPN tunnel.

b. Allow VPN connected clients to establish media through the A/V Edge Server public interface.

7. **Internal training**
IT and helpdesk will always know more about a product that an end user. But at what point should users know how to troubleshoot certain issues themselves or to gather and send the appropriate information to the helpdesk so the issue can be resolved in a timely manner?

User education is sometimes taken in a light-hearted manner. Users, for the most part, are not familiar with Lync as to how it works behind the scenes. Error messages, improper permissions, and processes are not a user's priority; it's the IT department's problem. But what should a user know to ensure they have a great experience with the Lync application?

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Here are some tips for ensuring a great rollout and adoption:

1) Set achievable and reasonable expectations.

2) A short introduction class for groups of users can save time. Try the following to give users a controlled, and more importantly, pleasant first experience:
   a. Demonstrate the correct functionality of the client.
   b. Give them some How-to documentation,
   c. Utilize Microsoft Quick start guides for end user training.
   d. User training can also be held by using Lync Server 2013 meetings so that users can experience how the product can be used in real-time
   e. Have them use it in front of you.
   f. Be sure to list out the functionality differences between the old solution and the new Lync Server 2013 client. ("The old solution could do this, why can't I now?")

3) Show them a process for submitting Lync issues. The more information a technician has, the more likely they can resolve an issue in a shorter amount of time. Information tools are readily available for end users, but they just don't know about them. Give your end users better Lync support by encouraging the use of the following when submitting issues:
   a. Print screen → Microsoft paint for a screenshot
   b. Problem steps recorder (PSR) to show a process with possible error message
   c. Start a knowledge base of Lync Server 2013 within your IT department along with a list of known issues

8. **HA and DR testing**
   Know the difference between HA and DR. Also recognize that the solutions must be tested often to ensure they are still functioning after they are deployed.

Resiliency is the ability of a system to minimize disruption of service or functionality during a component failure. High availability is the ability of a system to be constantly available to its users. However, Lync high availability is used to maintain a specific Lync role or prevent the use of a single point of failure within the infrastructure.

Disaster recovery (DR) is the process, policies, and procedures that are related to preparing for recovery or continuation of technology infrastructure which are vital to an organization after a natural or human-induced disaster. A disaster would be situations where there was a fire in a building, loss of electric power, or PSTN/SIP trunk service outage.

A disaster would need to be recovered from in order to restore functionality. This often takes time and can leave users without a Lync solution, or possibly a primary phone solution.

Often, with Lync Server 2013, high availability is considered to be within a physical site, while disaster recovery is generally considered to be between physical sites. If all of the servers in the HA solution are at a single datacenter and the datacenter becomes unavailable, you will lose Lync functionality. Due to restrictions of Lync server's roles (aside from persistent chat), high availability cannot span multiple physical sites. Lync Disaster recovery, also known in Lync as pool pairing, will allow another central site to host users from a separate pool, thereby allowing all Lync functionality to flow through the failover site. In Lync Server 2013, pool pairing (DR) is available to Standard Edition servers as well as Enterprise Edition servers.

When a HA or DR solution is in place, it must be tested on a regular basis. As it does take resource time, down time, and scheduled outages, it is important to test your solutions to ensure they are failing over correctly. With the application of topology changes, feature changes, and product updates you must check functionality changes within Lync itself. It is better to have a regular testing schedule and spend the time to ensure functionality, than to get yourself in a predicament where you must drop what you are doing and immediately restore functionality as quickly as possible. Then have to explain why functionality was lost.

9. **Before you deploy Lync on smartphones and tablets...**
   With the introduction of Windows 8, applications have become a way of life for IT administrators and end-users. Being prepared for the impact of new hardware and Lync technologies is imperative when integrating them into your network environment.

   A. **Identify Lync traffic:** Lync uses an encrypted signaling protocol making it difficult for the network to identify. Traditional snooping mechanisms that fingerprint real-time traffic through the popular SIP signaling protocol won't work here.

      And if you can't see the Lync traffic, then you can't take any actions to optimize it and you'll spend more time troubleshooting problems. The network needs to be able to identify Lync streams in session and map that traffic to a user and device. This information will be critical for other deployment and operational functions.

   B. **Prioritize Lync over less latency-sensitive traffic:** Once the network identifies and classifies Lync traffic, it can then be dynamically conditioned to deliver quality of service (QoS)—on an application-by- application and device-by-device basis. The network should be configured to tag Lync traffic with appropriate class of service (CoS) and type of service (ToS) tags ensuring proper QoS over the air and over the wire.

   C. **Push "high quality" Wi-Fi everywhere:** As Lync is increasingly used on mobile smartphones and tablets, IT needs to ensure that WLAN coverage extends pervasively to all parts of a campus, with uniformly good signal levels. RF management techniques should be employed to maximize coverage and network capacity, while avoiding interference. A few good rules of thumb for Wi-Fi coverage include:

      - Minimum RF signal (RSSI) levels of -67 dBm
      - Minimum signal-to-noise ratio (SNR) of 25 dB
      - Co-channel separation of 20 dB
      - 100% coverage in all areas of Lync use

Please refer to http://technet.microsoft.com/en-us/library/jj688118.aspx for more information on network bandwidth requirements for media traffic.

10. **When deploying Enterprise Voice, know your SIP.**
    SIP is the backbone of Lync Enterprise Voice functionality. Familiarize yourself/IT/Helpdesk with SIP to help with VoIP troubleshooting.

The abstract of RFC 3261 defines SIP as an application-layer control or signaling protocol for creating, modifying, and terminating sessions between one or more participants. These sessions include Internet- based telephone calls, multimedia distribution, and multimedia conferences. The basic commands of SIP are as follows:

- INVITE: Invites a user to a call
- ACK: Acknowledgement is used to facilitate reliable message exchange for INVITEs.
- BYE: Terminates a connection between users

- CANCEL: Terminates a request, or search, for a user. It is used if a client sends an INVITE and then changes its decision to call the recipient.
- OPTIONS: Solicits information about a server's capabilities.
- REGISTER: Registers a user's current location
- INFO: Used for mid-session signaling

In order to help troubleshoot SIP it is often helpful to see it in the context of a SIP session:
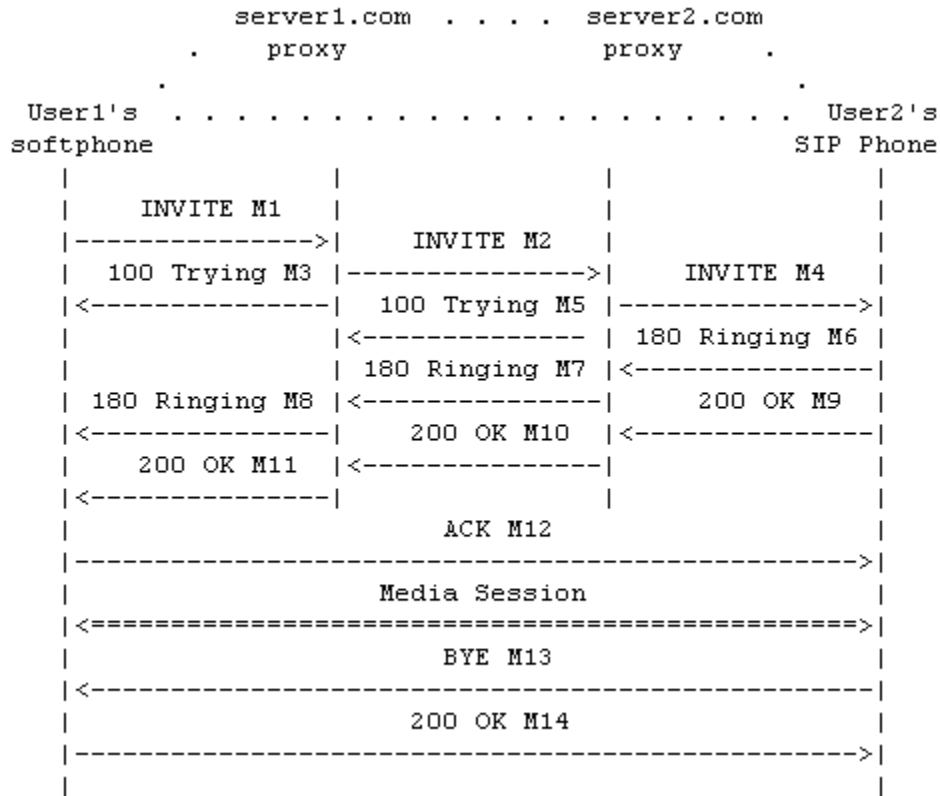
```
          server1.com  . . . .   server2.com
        .    proxy                  proxy      .
      .                                          .
 User1's  . . . . . . . . . . . . . . . . . .  User2's
softphone                                       SIP Phone
     |                 |              |              |
     |   INVITE M1     |              |              |
     |---------------->|   INVITE M2  |              |
     |  100 Trying M3  |------------->|   INVITE M4  |
     |<----------------|  100 Trying M5 |------------->|
     |                 |<-------------- | 180 Ringing M6 |
     |                 | 180 Ringing M7 |<---------------|
     | 180 Ringing M8  |<---------------|   200 OK M9  |
     |<----------------|   200 OK M10   |<---------------|
     |    200 OK M11   |<---------------|              |
     |<----------------|                |              |
     |                        ACK M12                 |
     |----------------------------------------------->|
     |                    Media Session               |
     |<==============================================>|
     |                        BYE M13                 |
     |<-----------------------------------------------|
     |                      200 OK M14                |
     |----------------------------------------------->|
     |                                                |
```

Figure: SIP session example with SIP trapezoid[2]

The transaction starts with user1 making an INVITE request for user2. But user1 doesn't know the exact location of user2 in the IP network. So it passes the request to server1. Server1 on behalf of user1 forwards an INVITE request for user2 to server2. It sends a TRYING response to user1 informing that it is trying to reach user2. The response could have been different but we will discuss the other types of responses later. If you are wondering how server1 knows that it has to forward the request to server2, just hold on for a moment. We will discuss that while going through the registration process of SIP.

Receiving INVITE M2 from server1, server2 works in a similar fashion as server1. It forwards an INVITE request to user2. (Note: Here server2 knows the location of user2. If it didn't know the location, it would have forwarded it to another proxy server. So an INVITE request may travel through several proxies before reaching the recipient.) After forwarding INVITE M3, server2 issues a TRYING response to server1.

The SIP phone, on receiving the INVITE request, starts ringing informing user2 that a call request has come. It sends a RINGING response back to server2, which reaches user1 through server1. So user1 gets a feedback that user2 has received the INVITE request.

User2 at this point has a choice to accept or decline the call. Let's assume that he decides to accept it. As soon as he accepts the call, a 200 OK response is sent by the phone to server2. Retracing the route of INVITE, it reaches user1. The softphone of user1 sends an ACK message to confirm the setup of the call. This 3-way-handshaking (INVITE+OK+ACK) is used for reliable call setup. Note that the ACK message is not using the proxies to reach user2 as by now user1 knows the exact location of user2.

Once the connection has been setup, media flows between the two endpoints. Media flow is controlled using protocols different from SIP (e.g., RTP).
When one party in the session decides to disconnect, it (user2 in this case) sends a BYE message to the other party. The other party sends a 200 OK message to confirm the termination of the session.

The take away from this example is to recognize where different SIP transactions take place. If you can identify the transaction that is showing an error, you can identify the source of the problem.

Global Knowledge courses that go into more detail on the SIP protocol include:

Introduction to Session Initiation Protocol (SIP) v2.0

Voice over IP Foundations

VoIP Protocol Essentials: SIP

Microsoft Lync Server 2013 requires a proactive approach to address the many issues we can incur during its deployment. It is important to realize what issues our company may encounter, and the resolutions to those issues, before the deployment is held up due to an unforeseen miscalculation. The more prepared we can be, the better our implementation will be. It is essential to do all preparation as written by Microsoft to ensure that you've diligently attended to all the details before commencing your rollout.

To successfully implement Lync Server 2013 you must know about the protocols, the administrative tools, and ensure that you are working with a completely supported environment according to Microsoft standards. If you are not familiar with any of the concepts brought before you, be sure to learn about them. It's better to learn about it now and troubleshoot without issue rather than having to scramble to resolve an issue to which you are not familiar.

The knowledge and tools to deploy, implement, and maintain Lync Server 2013 are at your fingertips. With these recommendations, as well as the technical links provided, you will avoid the common mistakes encountered during a Microsoft Lync Server 2013 deployment.

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Core Solutions of Microsoft Lync Server 2013 (M20336)

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About the Author

Richard Luckett is a consultant and instructor specializing in Microsoft messaging and communications. He has written two books and seven courses on Microsoft Exchange Server along with a number of technical articles. He has been an instructor with Global Knowledge for 13 years where he currently teaches both Exchange server and Lync Server courses.

Notes

[1] http://technet.microsoft.com/en-us/lync/jj879331.aspx - Lync 2013 Rollout Adoption and Success Kit

[2] Example provided by http://www.siptutorial.net/SIP/example.html © 2005 K.Banerjee