Lync Server 2013 On-Premises Architectures

Architectural design guidance for planning and deployment

Components of a Lync Server 2013 deployment

Lync Server 2013 relies on a large number of external components. These consist of systems such as operating systems, database systems, networking systems, and phone systems.

Lync Pools

Certain Lync roles can be combined on multiple servers to provide fault tolerance and high availability. When a role is combined across multiple services it is called a pool. Lync Server 2013 can accommodate the following pools:

- *Front End Pool* — Provides services such as user authentication and registration, presence information, address book services, instant messaging, web conferencing, dial-in conferencing over PSTN, audio visual conferencing, and application hosting. In addition, the front end pool can optionally accommodate roles such as monitoring, archiving, and persistent chat.
- *Edge Pool* — Edge servers can be combined into pools in order allow a large number of external users the ability to access your Lync deployment.
- *Mediation Pool* — The mediation role accommodates voice and multiple servers can be combined to form a pool.
- *Director Pool* — Using the Director role is not recommended in Lync Server 2013, however, a pool can be created using multiple servers.
- *Persistent Chat Pool* — To accommodate a large amount of persistent chat conversations multiple servers can be combined.

Central Site

A central location that provides services to non-central locations.

Branch Site

A geographically separate location from the central location.

Required Components

Lync Server 2013 requires a number of external components in order for all features to function properly. It is important to be familiar with these components when planning a Lync deployment. These include:

- *Wide Area Network (WAN)* — A WAN is a network that spans a geographic distance between locations. A WAN is important when a Lync deployment includes branch locations. A Survivable Branch Appliance can be sued to accommodate an unreliable WAN.
- *Public Switched Telephone Network (PSTN)* — The traditional phone network.
- *PSTN Gateway* — A device that connects the Lync phone system to the traditional phone system.
- *Reverse Proxy* — A way for external traffic to communicate with an internal network without connecting directly to systems on the internal network. Instead an external user connects to the Reverse Proxy and the Reverse Proxy connects to the internal system.
- *Firewall* — A special filter for network traffic.
- *Office Web Apps Server* — A server that provides Microsoft Office PowerPoint integration with conferencing.
- *Internet Information Services (IIS)* — Microsoft's web server which is included as part of the Windows Server operating system.
- *SQL Server* — Microsoft's database server. SQL Server Express Edition is used by all Lync front end servers. SQL Server Enterprise Edition can be mirrored for high availability databases. Failover happens automatically when a SQL Server Witness is implemented.
- *Active Directory* — Lync requires Active Directory Domain Services to maintain groups, users, and other topology information. In addition, Lync Server requires a Certificate Authority for secure, encrypted data transfer and Active Directory Certificate Services can provide this service.
- *File Share* — Lync requires a shared directory for file storage.

What's New in Lync Server 2013

High Availability and Disaster Recovery

Front End pools can be geographically dispersed which provides benefits such as:

- Front End pool can fail over to another geography
- Central Management can be failed over and then act as the active master for managing both sites

Also, SQL Server can be mirrored with automatic failover when a SQL Server Witness is deployed.

Reduced Topology Complexity

To reduce complexity and increase availability a number of changes were made to simplify Lync topologies. In particular, the Director role is now optional (and not recommended) and a number of roles are now collocated on the Front End Servers. These include:

- Monitoring
- Archiving

> *Everything should be made as simple as possible, but not simpler.* – Albert Einstein

Lync Web Application

Lync now has a web application with full conferencing support. This allows people to join conferences without the requirement of installing a local Lync client.

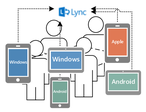
Enterprise Voice Enhancements

Improvements in voice features, routing, and support for multiple trunks provide increased stability and reliability in voice operations.

Conferencing Enhancements

The conferencing capabilities of Lync Server 2013 include:

- Support for new clients such as Android, iOS, and Windows Phone
- Gallery view of shows live video feeds of conference participants with increased visibility into the current speaker
- More advanced PowerPoint integration including the ability to view a slide deck independently of what is being presented



Hybrid Support for On-Premises and Office 365

Increased support for hybrid scenarios where some users are located on the local premises and some users are located in the cloud on Office 365.

Server Roles

Front-End Server Roles

- Audio / Video Conferencing
- Mediation
- Persistent Chat
- Monitoring
- Archiving

Additional information about Front End Servers

- Each server stores user and conference data in local databases using SQL Server Express Edition
- In Lync Server 2013 the Monitoring and Archiving roles are always co-located on the Front End Servers
- Mediation is optional in the front end pool and can also be stand-alone

Stand-Alone Server Roles

- Edge Services
- Persistent Chat
- Mediation
- Director

Additional information about Stand Alone Servers

- The Director role is optional in Lync Server 2013
- Mediation can be co-located on front end
- Persistent Chat can be co-located on front end when using Standard Edition

Backend Database Servers

Databases on the backend servers include:

- Persistent Chat
- Compliance
- Monitoring
- Metrics
- Archiving
- Configuration
- Others

SQL Server Database Mirroring

- Redundancy and throughput
- Increases availability
- Increases data protection
- Improves availability of databases during upgrades and updates

Installation Overview for Lync Server 2013

1: Setup Windows Server

- Add required roles, services, and features to the Windows Server

2: Install Lync Files and Administrative Tools

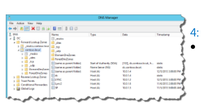
- Insert media and install Setup files
- Results in Lync Server Manager and Lync Server Deployment Wizard
- Open Lync Server Deployment Wizard and Install Administrative Tools

3: Prepare Active Directory

- Use Lync Server Deployment Wizard to prepare Active Directory domain

4: Create DNS Records

- Use DNS Manager on the Active Directory server to configure DNS records for Lync



5: Prepare First Standard Edition Server

- Use Lync Server Deployment Wizard

6: Design, Define, Configure and Publish New Topology

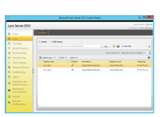
- Use Lync Server Topology Builder which was installed in Step 2 with the Administrative Tools

7: Install Lync Server System

- Use Lync Server Deployment Wizard

8: Add and Enable Users

- Use Lync Server Control Panel



Lync

http://aka.ms/lync15docs

Example Architectures for Increasing High Availability and Disaster Recovery

No High Availability

Limited deployment, product evaluation, development, and testing

One Lync Server Standard Edition server with all roles:

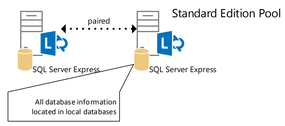
- Evaluation
- Very light and simple workloads
- One server with one pool
- Does not have any fault tolerance

Limited High Availability

Simple fault tolerance, does not support high availability

Two Lync Server Standard Edition servers, paired, with all roles:

- Basic fault tolerance
- Manually move users from one server to another in the event of a server failure
- Allows for scaling up number of Standard Edition servers to increase number of users
- Scale # of servers based on # of users

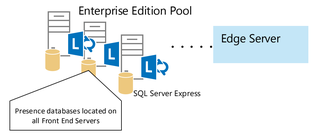


Full High Availability

Advanced fault tolerance and full high availability

Two or more Lync Server Enterprise Edition servers with dedicated backend high availability database

- Advanced fault tolerance
- Users live in pool; no service disruption in the event of a single server failure
- Dedicated backed database servers
- Scale # of servers based on # of users

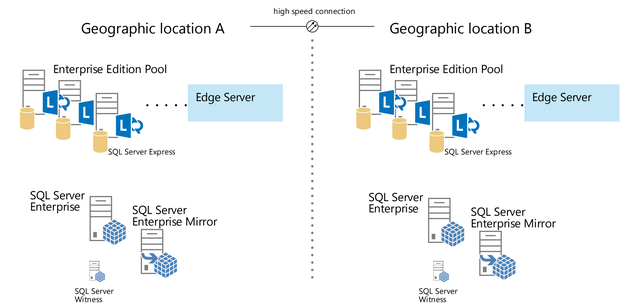


Full High Availability and Disaster Recovery with Geographic Failover

Multiple pools, geographic redundancy

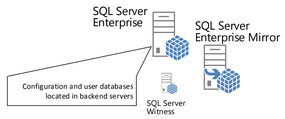
Two or more Lync Server Enterprise Edition servers with dedicated backend high availability database and geographically separated mirror

- Geographically advanced fault tolerance and disaster recovery
- Users live in pool; no service disruption in the event of a single server failure
- Dedicated backed database servers
- Scale # of servers based on # of users



Important: The example architectures in this poster are not definitive. It is important to understand the underlying needs of the user base.

Example: A small organization might need very high availability for mission critical processes and cannot wait for the manual fail over that is required with Standard Edition Servers. In this scenario, even though the organization is small, Enterprise Edition with automatic fail over and geographic redundancy might be recommended.



Example Architectures for Small, Medium, and Large Organizations

Sample Small Organization

Two Standard Edition Servers

Sample statistics for this organization:

- 4,000 users at central site
- Paired Standard Edition servers
- 2,000 users homed per server
- All user information synchronized between servers to accommodate simple (manual) fail over
- Provides simple fault tolerance

Edge Server

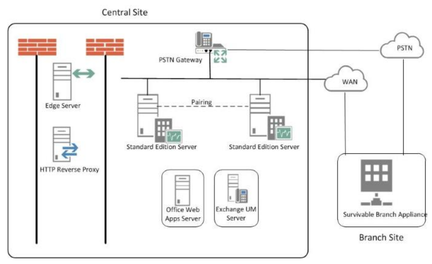
Edge Server not required for internal IM, presence, and conferencing but recommended to provide external communications:

- Accommodates home and out of office users
- Accommodates users outside the organization
- Supports federation with partners, vendors, and customers

Branch Site Survivability

In this example a pilot program using Enterprise Voice for a complete voice solution is depicted:

- Some pilot users located in a branch office
- Branch does not have a reliable Wide Area Network (WAN) so a Survivable Branch Appliance is deployed
- If branch WAN link goes down branch users still maintain voice and messaging capabilities



Exchange Unified Messaging Deployed

In this example a server is deployed for Exchange Unified Messaging (UM):

- Call answering and voice messages
- Messages received through email in Outlook
- Auto attendant and fax services

Office Web Apps Deployed

In this example a server is deployed for Office Web Apps Server:

- Provides integration with Office 2013
- Enables ability to share PowerPoint slides in web conferences

Sample Medium Organization

Three Enterprise Edition Servers

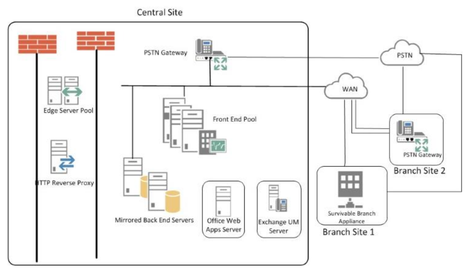
Sample statistics for this medium organization:

- 20,000 users at the central site
- Three Enterprise Edition servers make up the front end pool
- Provides full High Availability for Front End Servers

Database Servers Mirrored

The SQL Server backend servers are mirrored:

- Provides high availability for central databases
- If a database server fails the secondary database can take over
- Failover happens automatically if a SQL Server Witness is deployed



Edge Servers

Multiple edge servers are deployed as a pool:

- Accommodates larger number of external users
- Supports federation with more partners, vendors, and customers

Branch Site Deployment Options

Enterprise Voice deployed as voice solution:

- Branch Site 1 includes a Survivable Branch Appliance
- Accommodates unreliable Wide Area Network (WAN) connection

DNS Load Balancing

DNS Load Balancing deployed for Front End Pool and Edge Pool SIP traffic:

- Hardware load balancers focused on HTTP traffic
- Reduces setup and maintenance of hardware DNS solution

Disaster Recover Option

Disaster recovery is an option:

- This scenario does not include disaster recovery
- Disaster recovery could be added by establishing a second data center

Office Web Apps Deployed

In this example a server is deployed for Office Web Apps Server:

- Provides integration with Office 2013
- Recommended for conferencing
- Enables ability to share PowerPoint slides in web conferences

System Center Operations Manager

Provides health monitoring of Lync Servers:

- Recommended to help ensure service availability for end users
- Added to SCOM through a Management Pack for Lync

Exchange Unified Messaging Deployed

In this example a server is deployed for Exchange Unified Messaging (UM):

- Call answering and voice messages
- Messages received through email in Outlook
- Auto attendant and fax services

Monitoring Server

In this example a monitoring server is deployed:

- Enables you to measure quality of Enterprise Voice calls and Audio Visual conferences
- Monitoring deployed on all front end pool servers, databases deployed on back end servers

Sample Large Organization with Multiple Data Centers

Paired Front End Pools

Sample statistics for this organization:

- Each site has a front end pool with six servers
- The front end pool of site A is paired with Site B for disaster recovery

Database Servers Mirrored

The SQL Server backend servers are mirrored:

- Provides high availability for central databases
- If a database server fails the secondary database can take over
- Failover happens automatically if a SQL Server Witness is deployed

Monitoring and Archiving Server

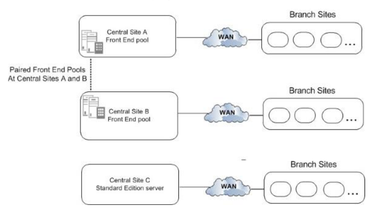
In this example a monitoring server is deployed:

- Enables you to measure quality of Enterprise Voice calls and Audio Visual conferences
- Databases located at site B on dedicated server, data for all sites

Standard Edition Server

Branch site is using Lync Server Standard Edition:

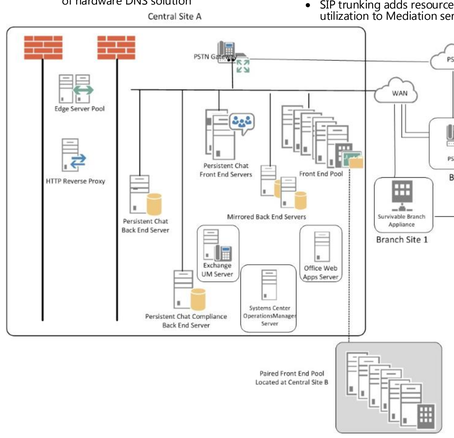
- Site C is a branch with only 600 users
- Avoids running site C conferences over Wide Area Network (WAN)



DNS Load Balancing

DNS Load Balancing deployed for Front End Pool and Edge Pool SIP traffic:

- Hardware load balancers focused on HTTP traffic
- Reduces setup and maintenance of hardware DNS solution



SIP Trunking and Mediation Server

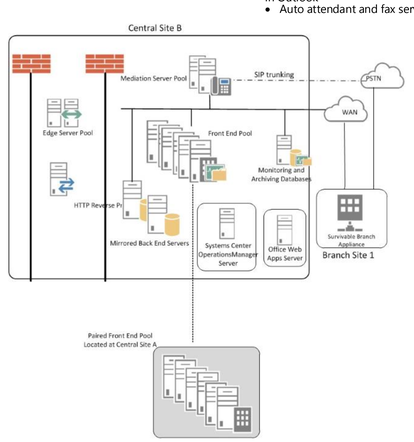
When using SIP trunking a stand-alone Mediation server is recommended:

- When not using SIP trunking it is recommended to co-locate Mediation server on front end servers
- SIP trunking adds resource utilization to Mediation server

Persistent Chat

Multiple Persistent Chat servers deployed:

- Provides ability to handle load of high number of users
- Provides high availability
- Includes servers for compliance



Exchange Unified Messaging Deployed

In this example a server is deployed for Exchange Unified Messaging (UM):

- Call answering and voice messages
- Messages received through email in Outlook
- Auto attendant and fax services

Office Web Apps Deployed

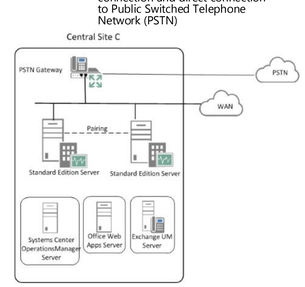
In this example a server is deployed for Office Web Apps Server:

- Provides integration with Office 2013
- Recommended for conferencing
- Enables ability to share PowerPoint slides in web conferences

Branch Sites

Sample organization includes over 50 branch sites, only three shown:

- Survivable Branch Appliances deployed at sites without a reliable WAN connection
- Site B has reliable WAN connection and direct connection to Public Switched Telephone Network (PSTN)



Microsoft