

Microsoft Exchange Server 2010 Architecture

Management and Monitoring

Remote PowerShell

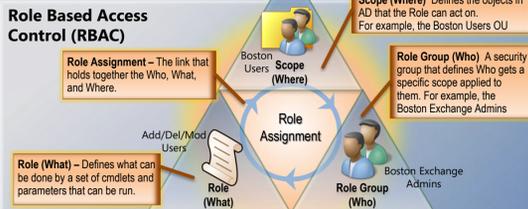
Remote PowerShell extends PowerShell from servers to client computers so commands can be executed remotely.

- Exchange Server 2010 takes advantage of new PowerShell v2.0 and Windows Remote Management
- All Exchange management tools are built on Remote PowerShell.
- Remote PowerShell enables administrators to run Exchange cmdlets on computers without the need to install Exchange management tools.

Exchange Control Panel

Management Tools now include the Exchange Control Panel (ECP). A web-based management console accessed from browsers that have no Exchange client-side software installed. ECP gives users the power to manage distribution lists, track messages, and edit personal information.

Administrators	Specialty Users	Users
Recipient management	Perform multi-mailbox searches	View account information and manage settings
Manage role groups and role assignment policies	Manage common settings for other users	Manage group ownership and membership



Role Based Access Control (RBAC) enables you to control, at both broad and precise levels, what administrators and users can do. RBAC also enables you to more closely align roles you assign users and administrators with the actual roles they hold within your organization.

- Three ways of assigning permissions:
 - Management Role Groups
 - Management Role Assignment Policies
 - Direct User Role Assignment
- Configuration done using Exchange Control Panel
- Dozens of default roles pre-configured and easily customizable
- RBAC is built into all management tools

Monitoring

Monitoring Exchange components is important to understand the health state of servers and server roles.

- Out of the box synthetic transactions via Remote PowerShell (test-*)
- Complete management pack for System Center Operations Manager

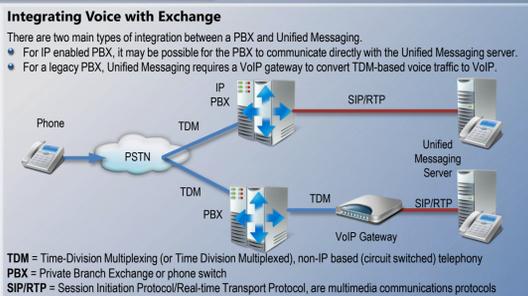
Unified Messaging Server Role

Call Answering Rules

New in Exchange Server 2010 Unified Messaging (UM), users can configure how incoming phone calls are handled with custom rules configured in the Exchange Control Panel.

Each Call Answering Rule has two parts:

- Conditions** - what criteria must be met before the rule will be applied to an inbound call.
 - If the caller is...
 - If during this period...
 - If my schedule shows that my status is...
 - If automatic replies are turned on...
- Actions** - what actions will be presented to the caller when all the conditions are met. The caller will hear the options and select using the phone pad.
 - Find me
 - Transfer the caller
 - Leave a voicemail



Voicemail Preview

Unified Messaging uses automatic speech recognition to create text from the voice recording, and inserts it in the voice message. The process is as follows:

- Unanswered call is forwarded to the UM server.
- UM server plays user's greeting (stored in their mailbox).
- UM server records caller, creates preview text, inserts with audio into message.
- UM server sends message to user's mailbox via Hub Transport Server.

Message Waiting Indicator

With MWI, Exchange Server notifies users of the presence and number of new or unread voicemail messages on their supported desk phones.

- Voicemail message is delivered to user's mailbox.
- UM Mailbox Assistant receives a notification message.
- UM Mailbox Assistant chooses a UM server and provides the request to the UM server.
- UM server chooses a VoIP gateway and sends a SIP NOTIFY through the gateway to the user's phone.

Call Answering

UM answers the call, plays a greeting, and then takes a message. The message is delivered to the user's mailbox.

Outlook Voice Access

This enables a user, from any phone, to retrieve messages (voice or email), access their calendar, or call Active Directory users or contacts.

UM Auto Attendant

Answer calls, play prompts to callers, present menus and allow callers to contact users by speaking or entering their names or extension numbers.

Play on Phone

Allows users with Outlook 2007 or 2010, or Outlook Web App, to play back voice messages under Outlook/OWA control on any phone.

Mailbox Server Role

Personal Archive and Retention Policies

Personal Archive

- Provides users with an alternate storage location to store historical messaging data.
- Messages can be moved to the personal archive manually or automatically using retention policies.
- Appears alongside the user's primary mailbox in Outlook or Outlook Web App.
- Archive Quota can be set separately from primary mailbox.

Retention Policies and Tags

- A Retention Policy is a group of retention policy tags that can be applied to a mailbox.
- A mailbox can have at most one retention policy.
- Retention Tag actions can include Move to Archive, Delete and Allow Recovery, and Permanently Delete.
- Default Policy Tag - A default policy tag (DPT) applies to items that do not have a retention tag applied.
- Retention Policy Tags (RPTs) are created for default folders such as Inbox, Deleted Items, etc.
- Personal Tags - Personal tags are used by Outlook 2010 and Outlook Web App users to apply retention settings to custom folders and individual items.
- Legal Hold Policy: Preserves edits to or deletions of email made by the user placed on hold, whether in their primary mailbox or personal archive.
- Message moved from mailbox to personal archive by policy or by user.

Recoverable Items Folder

These folders are not visible to the user.

- Deletions** - Items soft-deleted from Deleted Items Folder. Accessed through Outlook "Recover Deleted Items."
- Versions** - Original and modified copies of items when either Legal Hold or Single Item Recovery are enabled.
- Purges** - Hard-deleted items when either Legal Hold or Single Item Recovery are enabled.

Mailbox Moves

Mailbox moves are asynchronous and done by the Exchange Mailbox Replication Service (MRS) on CAS server roles.

- Admin creates move request in EMC or EMS. The command updates AD and then places a special message in the system mailbox.
- All instances of the MRS periodically check the system mailbox.
- MRS moves data from DB01 to DB02 and switches status to In Progress.
- When the move is almost finished, the mailbox is locked for a short time.
- When the move is complete, the moved mailbox on DB02 is activated.

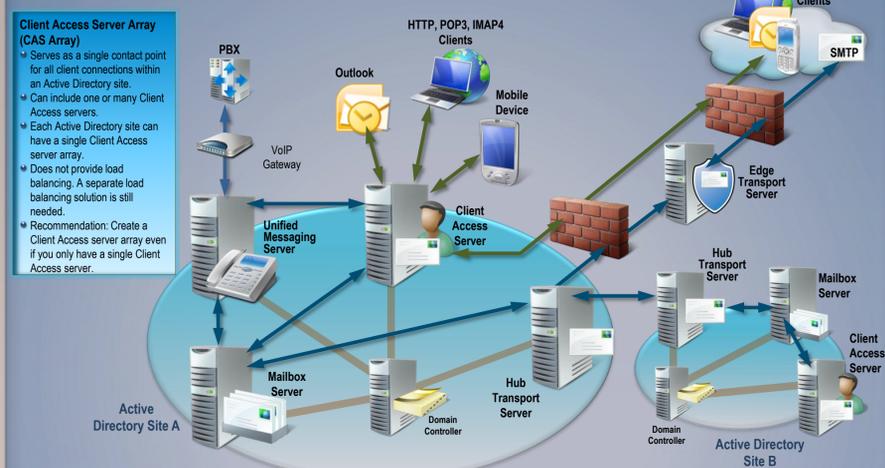
Multi-mailbox Search and How It Works

- Create a discovery search using the Exchange Control Panel or Exchange Management Shell.
- Uses the content indexes created by Exchange Search.
- Results are stored in a special mailbox type known as a "discovery mailbox."
- Members of the Discovery Management role group can perform discovery searches.
- Allows search of messages stored in mailboxes across one or more Exchange Server 2010 servers.
- Primary and Archive mailboxes can be searched including items in the recoverable items folder.

Types of Databases

- Mailbox databases** - Holds data that is private to an individual user and contains mailbox and archive folders that are generated when a new mailbox or personal archive is created for that user.
- Public folder databases** - Holds public folder information. Only one public folder database per server.
- Recovery database (RDB)** - Special kind of mailbox database that allows you to mount a restored mailbox database and extract data as part of a recovery operation. Only one RDB can be mounted at any time on a Mailbox server.

Exchange Server 2010 High-Level Architecture



Exchange Server 2010 includes the following server roles:

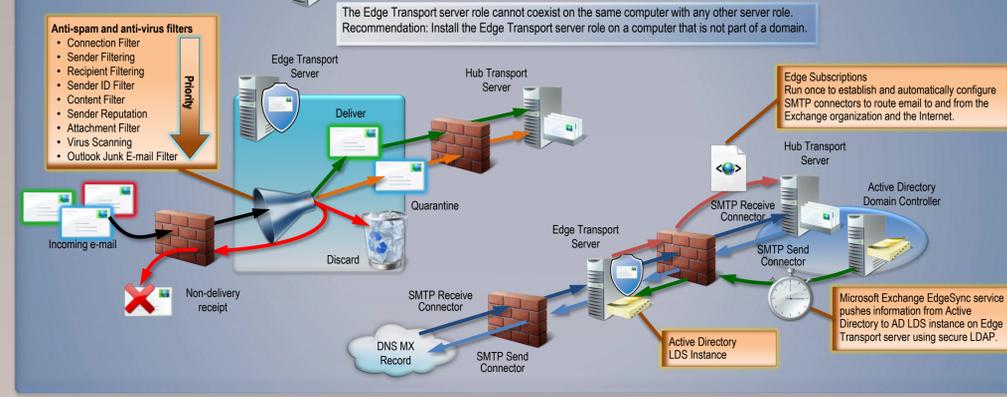
- Mailbox Server** - Back-end server that can host mailboxes and public folders.
- Client Access Server** - Middle-tier server that supports all Messaging clients, including Outlook, OWA and Exchange Web Services.
- Unified Messaging Server** - Middle-tier server that connects a PBX system to Exchange and combines voice messaging and email messaging into a single messaging infrastructure.
- Hub Transport Server** - Email routing server that routes email within the Exchange organization.
- Edge Transport Server** - Email routing server that typically sits at the perimeter of the topology and routes email in to and out of the Exchange organization.

Note: All Exchange server roles can be deployed on the same server except the Edge server role.

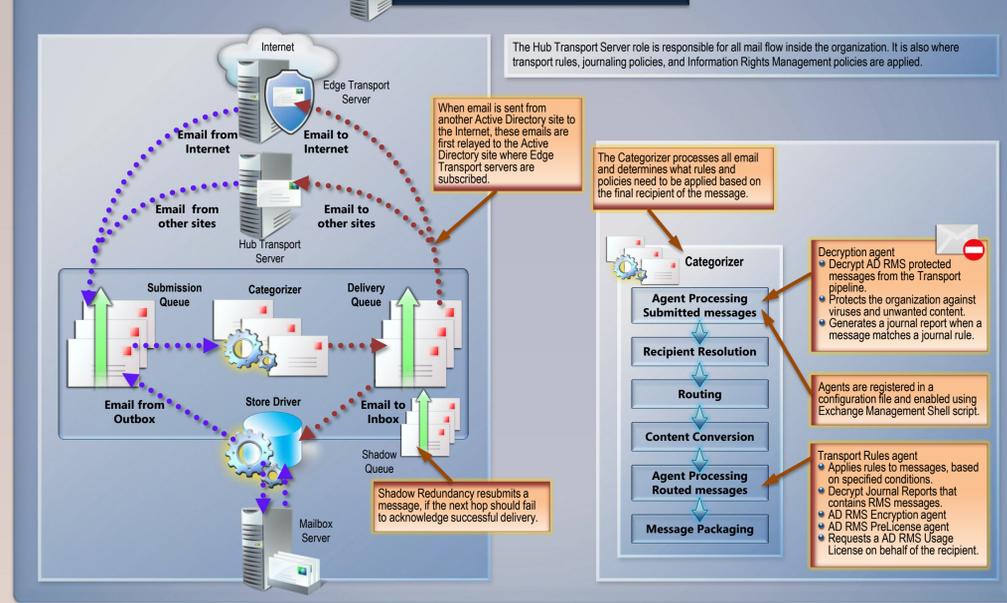
Exchange Server 2010 Server System Requirements

- Exchange Server 2010 requires a 64-bit server operating system.
- Exchange Server 2010 can be installed on Windows Server 2008 SP2 or Windows Server 2008 R2.
- Active Directory must be at Windows Server 2003 forest functionality mode or higher.
- At least one writable domain controller server and a Global Catalog Server (running Windows Server 2003 SP1 or later) in every Active Directory site that hosts Exchange Server 2010.

Edge Transport Server Role



Hub Transport Server Role



Client Access Server Role

RPC Client Access Service

Exchange Server 2010 moves most client processing to the Client Access Server to provide all data access through a single, common path. This change improves consistency for applying business logic to clients, and provides a better client experience when failover occurs.

- Provides a single point of data access using a common path for client connectivity including Web, MAPI, POP/IMAP, Address Book, AutoDiscover, and ActiveSync.
- Clients connect directly to the CAS Server.
- Uses the same Business logic for Outlook and other CAS clients:
 - Delta validation, especially Calendar logging
 - Archive mailbox infrastructure
 - Content/body conversion

Exchange ActiveSync

Allow/Block/Quarantine list

- Approved device list
- By device type
- By user
- Block an unsupported device
- Quarantine
- Email sent
- Admin approved

SMS Sync

- User composes SMS message in Outlook or OWA
- Exchange ActiveSync connection transfers message to user's phone
- User's phone sends SMS to intended recipient

Inbound

All SMS messages to phone are synchronized to Exchange, using Exchange ActiveSync, for access through any mail client.

Outlook Web App

Outlook Web App redesigned for Exchange Server 2010

- Supports all major browsers.
- Conversation view lets users see all messages in a thread, including messages not in the current folder.
- OWA can be configured to work with Office Communications/Lync Server without using Office Communicator.
- Users can share their calendars with people outside your organization.

Exchange Web Services (EWS)

EWS provides the functionality to implement client applications that access and manage Exchange store items.

- EWS provides programmatic access to the data stored within Exchange.
- EWS clients can integrate Exchange information into line-of-business (LOB) applications.
- SOAP provides the messaging framework for messages sent between the client application and Exchange Server.
- The Managed API provides an easy way to use the Microsoft.NET interface with EWS.

Outlook Anywhere

Configure using the Enable Outlook Anywhere Wizard in the Exchange Management Console.

MailTips

MailTips are informative messages displayed to users while they are composing a message. Microsoft Exchange Server 2010 analyzes the message, including the list of recipients to which it is addressed, and notifies the user with MailTips prior to sending the message to prevent accidental delivery or policy violations.

- The mail client queries the Web service on the Client Access Server for MailTips that apply to the recipients in the message. If the client is using OWA, CAS does the request on behalf of the user.
- The Client Access Server queries its cache of Group Metrics data. (Group metrics are created overnight and distributed to CAS Servers.)
- If the recipient is a mailbox that is located on a Mailbox server in the local site, the Client Access Server queries the Mailbox server to gather the Automatic Replies and Mailbox Full MailTips.
- If the recipient's mailbox is in another site, the Client Access Server requests MailTips information from the Client Access Server in the remote site, which then queries the local Mailbox server for MailTip data.
- The Client Access Server returns MailTip data back to the client (Outlook 2010 and OWA).

How MailTips work:

- Automatic replies
- Large audiences
- Reply-all on BCC
- External recipients
- Mailbox full
- Over-sized message
- Moderated group
- Restricted recipient
- Invalid recipient
- Custom MailTips

High Availability

