

IST346: Email and Messaging Services

What is email?

- A means to exchange electronic messages and data on the internet.
- First email system was MAILBOX, used at Massachusetts Institute of Technology starting in 1965.

Email – a IT manager's personal nightmare?

Technology Issues

- Uses a lot of storage.
- Complicated service
- Requires a lot of servers to operate at scale
- Illegitimate email – SPAM
- Not very secure
- Easy to “spoof”

Policy Issues

- ECPA compliance- email requires consent, being employed is consent
- Archival policy
- Subpoenas – pulling emails from backups for a court order
- Employees use company property

And despite all of this, everyone must have email!

Organizational policies for email

- Policies governing personal use of corporate email
- Policies governing types of data that can be transmitted.
- Message size limitations.
- Confidentiality / Ownership / Disclosure
- Employee is using the company's property.
- Sometimes the policy is "injected" into the outgoing message.
- <http://theoatmeal.com/comics/email> - funny take :-)

From: Barbara Wallace

To: Matthew I.

Subject: you are a computer genius!!!

Attachment: signature.gif smiley.gif

Hey, just wanted to say thanks for your help yesterday!!!
I had no idea that rebooting would fix my twitters! 😊

Deborah "Debs" Wallace

Social Media LEGEND, Entrepreneur

Founder / CEO of DoucheSpeak Media Group LLC

Engager, Conversation Starter, Communitizer



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Beeper number: 203 555 9024

Pet gerbil's phone number: 204 555 9002

twitter: @douchespeak www.facebook.com/douchespeak

linkedin.com/douchespeak

Email Namespaces

- How is this different from other namespaces we've discussed?
- Companies should use consistent email namespaces, so internal and externally bound mail should have the same address.
- Try using a namespace that is unique, company-wide.
 - Ex: tajorgen, mafudge, relstad
 - JohnSmith is not always going to be unique
- Namespaces should be relatively difficult to change
- Tokens should not be reused for a period of time, if at all.
- The full email address is a global namespace:
 - Ex. mafudge@syr.edu or michael.fudge@gmail.com

Reliability of Email

- Email is a utility, a constant, and therefore it's come to be expected to just work at all times.
- Unlike many other IT services, inaccessible or missed email will cost a company money.
- Outages should be almost non-existent.
- If architected properly, mail should never be lost in delivery.
- Email services are complex and require many servers/services to operate properly.
- Centralization of email services is a must for any modern organization.

Spam/Virus Blocking

- Spam and Viruses are normal occurrences in email, so a filtering service for both should exist in ALL email systems.
- Filtering of Spam and Viruses should be done on a server, not at the email client.
- Servers can be upgraded to handle increased load, clients are unpredictable.
- If messages are filtered for spam or viruses, logging should also be implemented.
- Sometimes false-positives can occur, which is why logging becomes important.

Email automation

- Automate as much as possible in an email system.
 - Account creation
 - Account changes (smtp address, display name, etc..)
 - Moving accounts between email servers
 - Access removal for employees who leave the company (depending on the company policy on this)
- What should we not automate:
 - Setting up away messages for users that are out of the office for extended periods (should always be setup by the user)
 - Setting up mail forwarding rules (should always be configured by the user or someone with rights to their account)

Email service monitoring

- An email service is important, so why would you implement it without proper monitoring?
 - Are the servers/services alive? (ping, telnet, nmap)
 - Disk space (size of disks, volumes, and mailbox databases)
 - Disk activity (read/write times)
 - Usage (user mailbox sizes and message counts)
 - Network traffic (response times for various methods or protocols used to access email by clients)
 - CPU utilization (both for the server as a whole and the individual services running within)
 - Delivery failures (both internal and external)

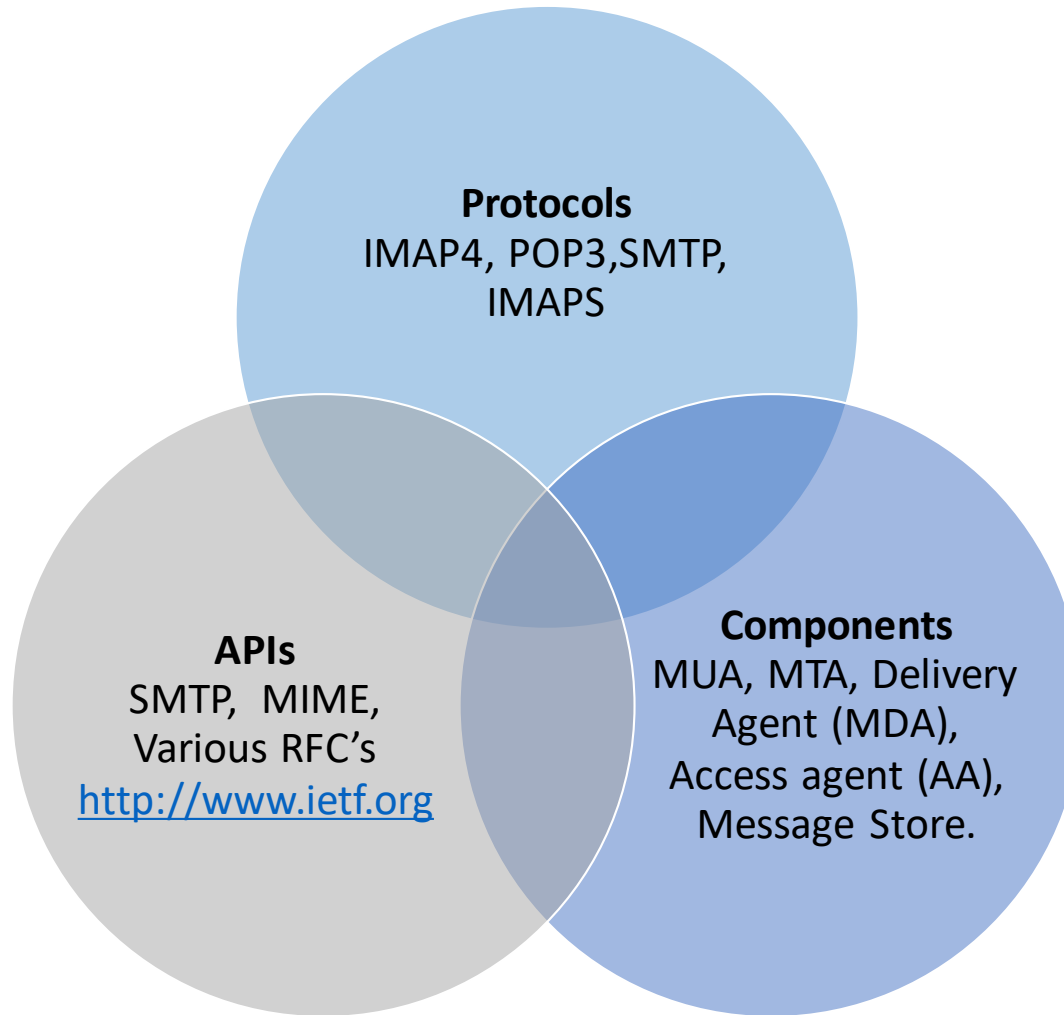
Scaling: considerations

- Email services need to be built to scale as demands inevitable WILL change.
- Take these things into consideration when planning to scale up or out your email service:
 - Number of users
 - Amount of mail sent by users
 - Size of messages sent
 - Large bursts of traffic (promotions, bulk emails, etc..)
 - Number of clients connecting (web, outlook, iMail, mobile)
 - Mobile clients can equal 2 traditional mail clients in terms of there demands on email servers.

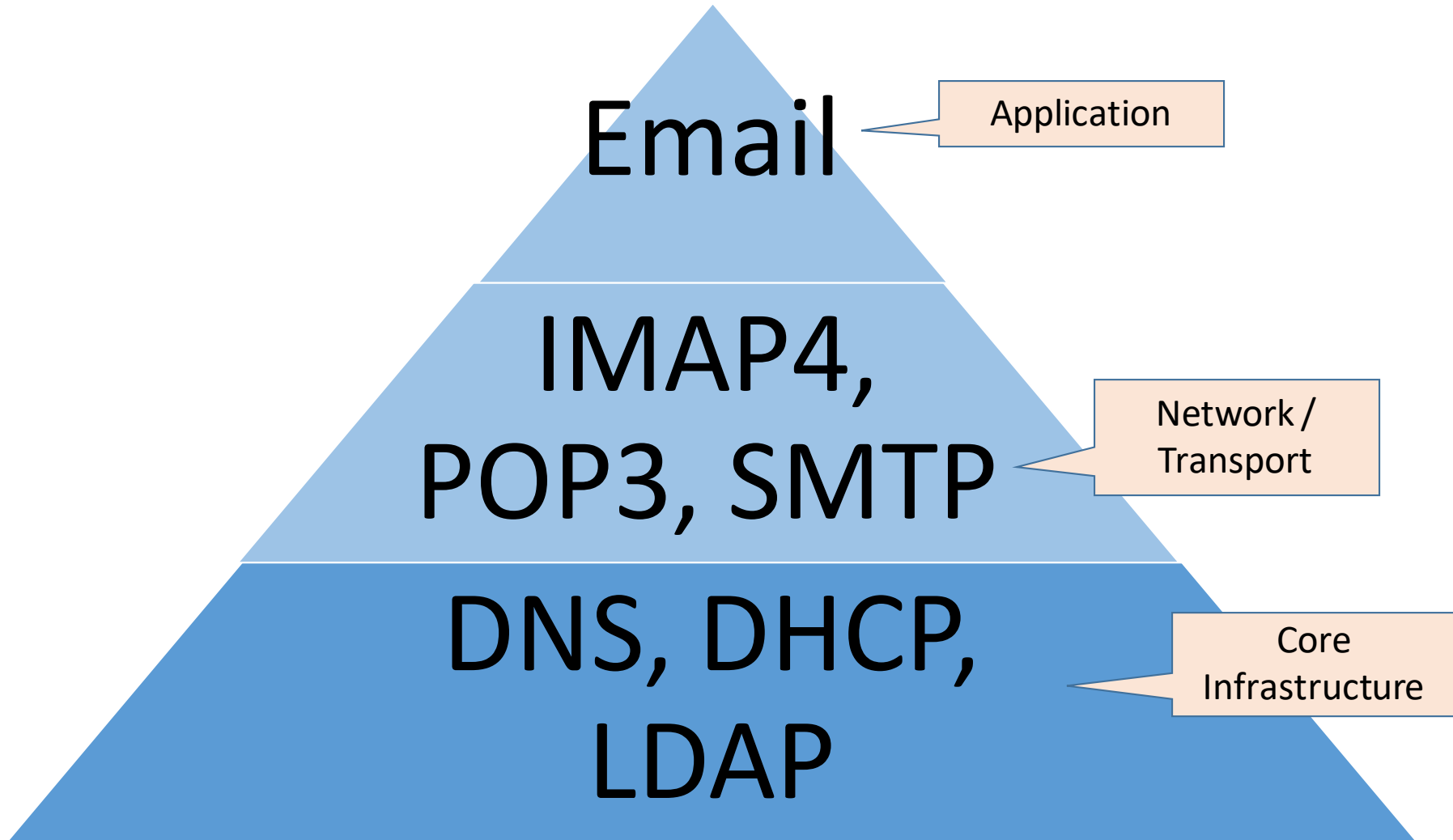
Getting technical regarding email

Service dependencies, components, and how it works.

Anatomy of Email - components



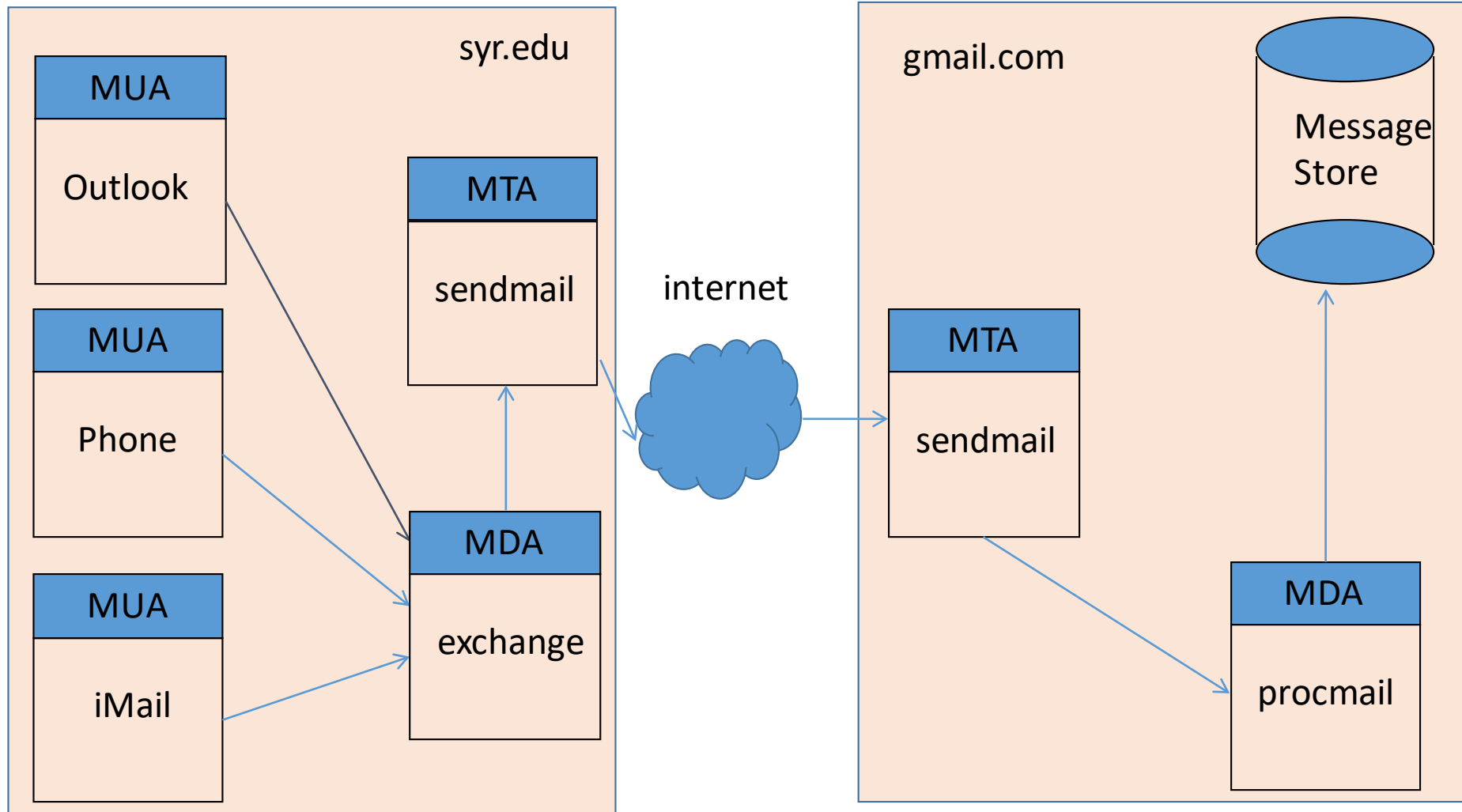
Email Service Dependencies



Components

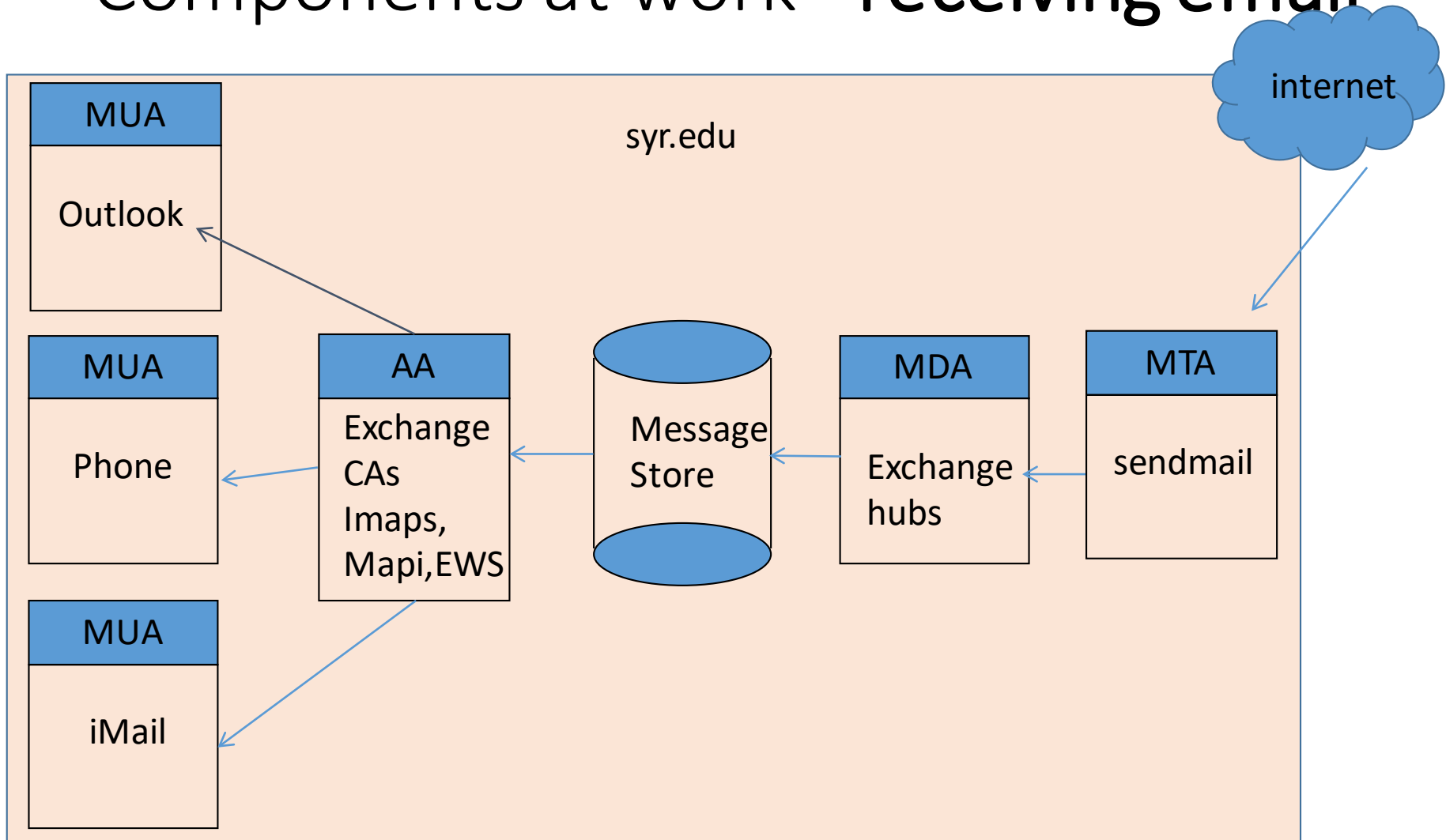
- **MUA** – Mail user agent. This is usually a client like Outlook, Thunderbird, or a web browser (in the case of gmail, for instance)
- **MTA** – Message transfer agent. Sends mail around the internet, from domain to domain. (Eg. Sendmail, exim, exchange, postfix,)
- **MDA** - Mail Delivery agent. Writes mail to the mail message from the MDA to the message store. (Eg. procmail, exchange)
- **AA** - Access agent. Exposes a protocol so users can read mail from the message store. Access protocols are POP3 and IMAP4 (Eg. ews, imaps, mapi)

Components at work –sending email



Example of sending an email from tajorgen@syr.edu to tim.jorgensen@gmail.com

Components at work –receiving email



Example of receiving an email from anywhere to tajorgen@syr.edu

Email addresses, Namespaces, and *You!*

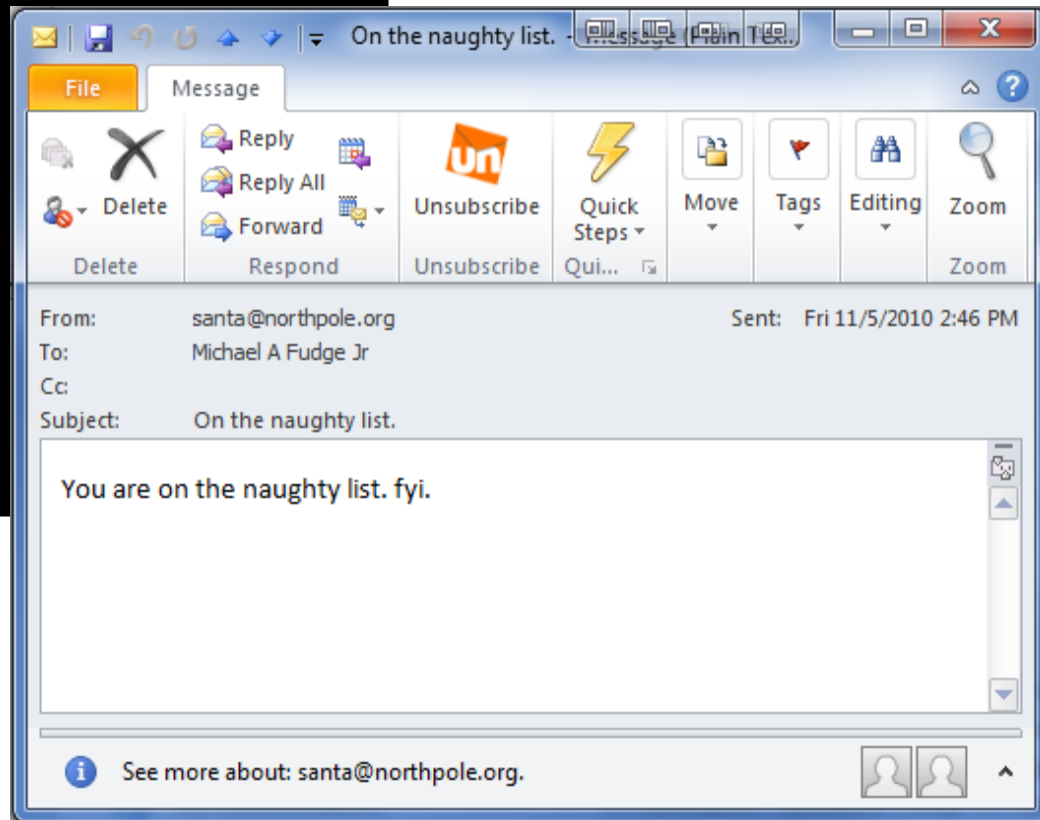
- Format: **mailbox@domain**
- Domains use MX records in DNS not A records. This is how mail from **northpole.org** knows where which server to send to **syr.edu**
 - dig syr.edu MX
- MTA's will accept mail even if the mailbox does not exist. MDA will reject it if the mailbox is not found.
 - "Undeliverable"

SMTP Protocol in Action

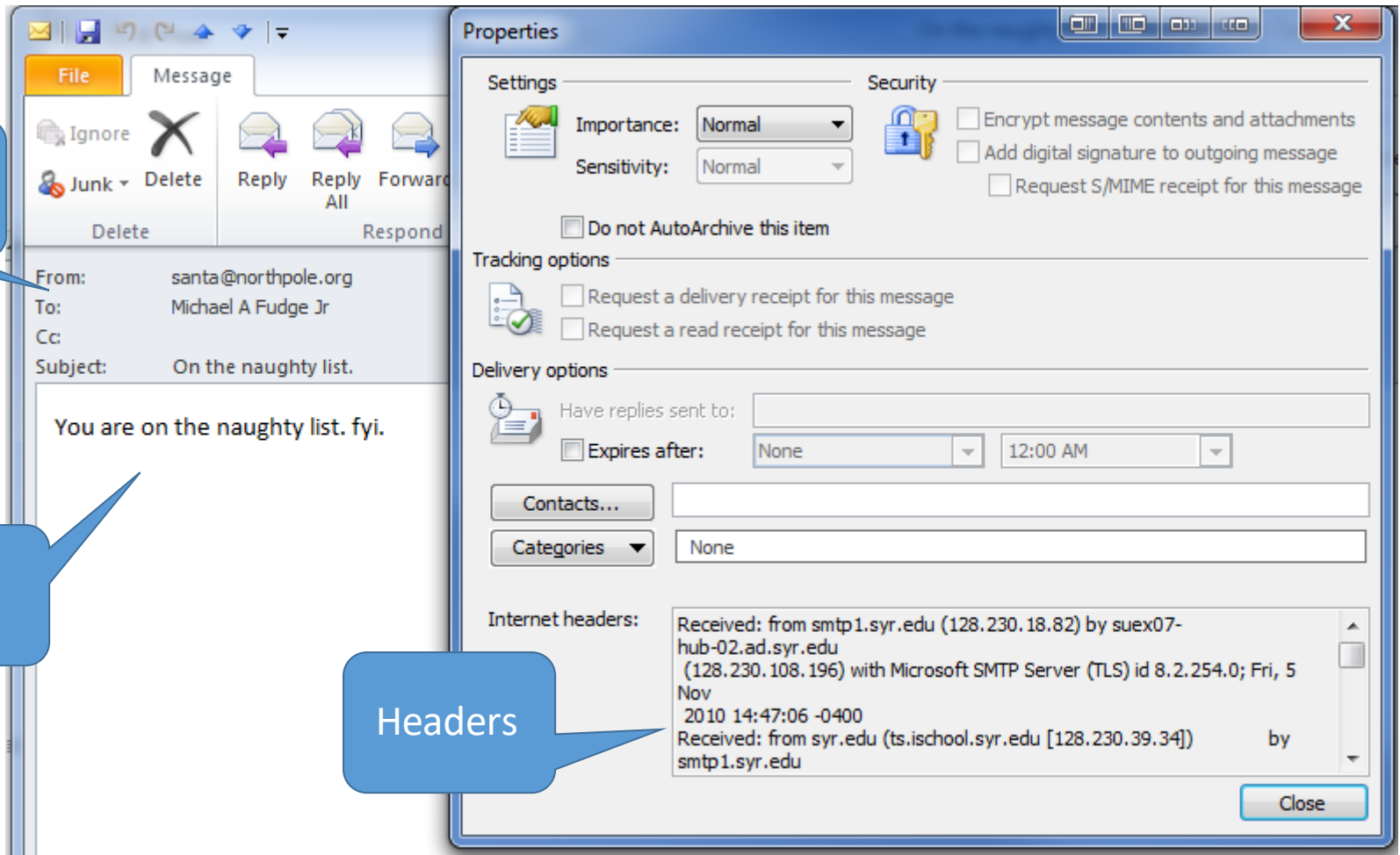
```
[root@ts ~]# telnet smtp-host.syr.edu 25
Trying 128.230.18.67...
Connected to smtp-host.syr.edu (128.230.18.67).
Escape character is '^]'.
220 smtp1.syr.edu ESMTP Sendmail; Fri, 5 Nov 2010 14:38:12 -0400
helo northpole.org
250 smtp1.syr.edu Hello ts.ischool.syr.edu [128.230.39.34], pleased to meet you
mail from: santa@northpole.org
250 2.1.0 santa@northpole.org... Sender ok
rcpt to: mafudge@syr.edu
250 2.1.5 mafudge@syr.edu... Recipient ok
data
354 Enter mail, end with "." on a line by itself
Subject: On the naughty list.
From: santa@northpole.org
To: mafudge@syr.edu

You are on the naughty list. fyi.
.
250 2.0.0 oA5IcCgC005890 Message accepted for delivery
quit
221 2.0.0 smtp1.syr.edu closing connection
Connection closed by foreign host.
[root@ts ~]#
```

The “S” in SMTP stands
for “Simple”. ☺



What's in an email message?



Other Types of Enterprise Messaging

Chat / Instant Messaging

- Chat / Instant Messaging
 - Send messages to people in real-time
 - Share information and files
 - Not a global namespace for all users like email!
 - Proprietary protocols. Applications do not integrate
 - Examples: Yammer, Chatter, Slack, Facebook Messenger

Slack – Workspace for teams

The screenshot displays the Slack web interface for a workspace named "Heroik". The left sidebar contains a list of channels, with "#lobby-water-cooler" selected and highlighted in green. Below the channels, there are sections for "DIRECT MESSAGES" (showing "slackbot", "jschultheiss", and "mikep") and "PRIVATE GROUPS" (showing "iamheroik" as online). The main channel view for "#lobby-water-cooler" shows a header with the channel name, a search bar, and a notification for "3" people. The channel history includes messages from "iamheroik" and "mikep" dated "Thursday, October 2nd, 2014". The messages discuss a random observation about a cowbell gif, a discussion about burying something in a discussion, and a link to a field notes page. A "Yesterday" separator is visible. On the right side, the "All File Types" panel shows a list of files shared in the channel, including a GIF file "WF.gif", a Google Drive Presentation "Heroik Brand Narrative Intro - Sketch Deck", a Google Drive Document "11 Heroik Tools that Will Take Your Work to The Next Level", and a JPEG file "Heroik in the outdoors". A "Trash" button is located at the bottom right of the file list.

Heroik ▼ ★ #lobby-water-cooler ▼ 3 ? ☰ 📺

Thursday, October 2nd, 2014

iamheroik 4:02 PM
Imao- random - I keep thinking this room is noisy and I find myself distracted by the cowbell gif, despite the fact there is no sound.
Interesting observation

iamheroik 4:10 PM
We need to bury it in discussion I think. How's your day going brotha?
I had the most interesting meeting with a old-world media guy. He'll make an excellent sales rep for Heroik Projects. The structure of the HIL is fucking awesomely lucrative

mikep 5:02 PM
Yeah, it's pretty distracting. I just got back to this. almost ready to head out for the day.
5:03 ★ got into chapter 12 and 13
editing in the headline book, that is
I've almost got him gone
this line ought to do it 😊

Yesterday

iamheroik 12:24 PM
<http://www.heroikinnovation.com/field-notes/>
Check it out - I got our Get Heroik Blog to feature the RSS feed with HD images on the Innovation Lab website- **why this matters: Technical Innovation** - 95% of the time when you embed an RSS feed on another site - the image quality sucks (it loads a tiny thumbnail visual). By adding the ability through a bit of custom code, we make a beautiful impression and can bring users over to GHDC. **By bringing people over to GHDC it cuts the content creation work load in half** - I'm still working on the new organization for both sites. I'll have an update soon when it's ready. This is just the proof of concept.

All File Types ▼
EVERYONE **JUST YOU** ▼ Add New File ▼

iamheroik **WF.gif** ★
Wed, Oct 1st at 3:35 PM
455KB GIF file · **Actions** ▼
Shared in #lobby-water-cooler

iamheroik **Heroik Brand Narrative Intro - Sketch Deck** ★
Tue, Sept 30th at 8:06 PM
Google Drive Presentation · **Actions** ▼
Private file in hbn-slide-deck

iamheroik **11 Heroik Tools that Will Take Your Work to The Next Level** ★
Tue, Sept 30th at 2:56 PM
Google Drive Document · **Actions** ▼
Private file

mikep **Heroik in the outdoors** ★
Fri, Sept 26th at 10:00 AM
1MB JPEG file · **Actions** ▼
1 comment Private file shared with you

iamheroik **coverart1a.png** ★

Trash

Yammer — Enterprise social networking

The screenshot displays the Yammer web interface for a company named "Alpine Style". The top navigation bar includes the company logo, a search bar, and links for "Admin", "My Networks", and user profile management. Below the navigation bar, the left sidebar shows the user's profile (Jim Parker) and a list of groups: "All Company", "Marketing", "Sales Team", "Product Team", "Conference Planning", "Four Leaf Community ...", and "Design". The main content area is divided into sections: "ANNOUNCEMENTS" featuring a post about a "Sierra Windcutter Series" collection; a "Share an Update" section with a text input field and options to "Add a Doc/Image" or "Post a Poll"; a "More" dropdown; and a post by "Alissa Chang" sharing a "User Conference Agenda" (an Excel file) with the text "Here is the finalized conference agenda. Please be sure to pass along to your customers." and tagging "@Linda Fong". The right sidebar contains a "NETWORK USAGE POLICY" section, a list of recent activity (e.g., "Linda Fong and 2 others started editing the Page Branding Guidelines"), a "SUGGESTED PEOPLE" section with "Follow" buttons for "Nicole Holbrook" and "Heidi Phillips", and a "TRENDING FILES" section listing "Conference Speakers", "Sierra Windcutter Linesheet", and "Sierra Windcutter Pitch Deck".

Alpine Style

Yammer

Admin - My Networks -

Search

Invite People Files Apps -

Jim Parker

My Feed

Inbox

GROUPS

- All Company
- Marketing
- Sales Team
- Product Team
- Conference Planning
- Four Leaf Community ...
- Design

More -

ANNOUNCEMENTS

New Collection: Sierra Windcutter Series
Posted by Joe O'Malley Tuesday at 3:57pm

Share an Update Add a Doc/Image Post a Poll

More -

What are you working on?

Top Conversations -

Alissa Chang
Here is the finalized conference agenda. Please be sure to pass along to your customers.
cc: @Linda Fong

User Conference Agenda
Uploaded to All Company » Files

xlxs

Reply · Unlike · Share · More · Tuesday at 2:51pm

Liked by you.

Show 2 older replies -

Joe O'Malley: Is it OK for us to share this list publicly?
Tuesday at 5:44pm · Reply · Like · Share · More

NETWORK USAGE POLICY
[SEE YOUR NETWORK USAGE POLICY](#)

Linda Fong and 2 others started editing the Page Branding Guidelines in the Marketing group.

Steve Johnson installed the iPhone application.

Alissa Chang uploaded the file User Conference Agenda.

Andrea Blandrea has joined the network.

Matt Lee published a new Page User

SUGGESTED PEOPLE [see all](#)

Nicole Holbrook
Senior Marketing... [Follow](#)

Heidi Phillips
Sr. Visual Desig... [Follow](#)

[Invite people to join](#) [Invite](#)

TRENDING FILES

Conference Speakers
Posted by Jim Parker

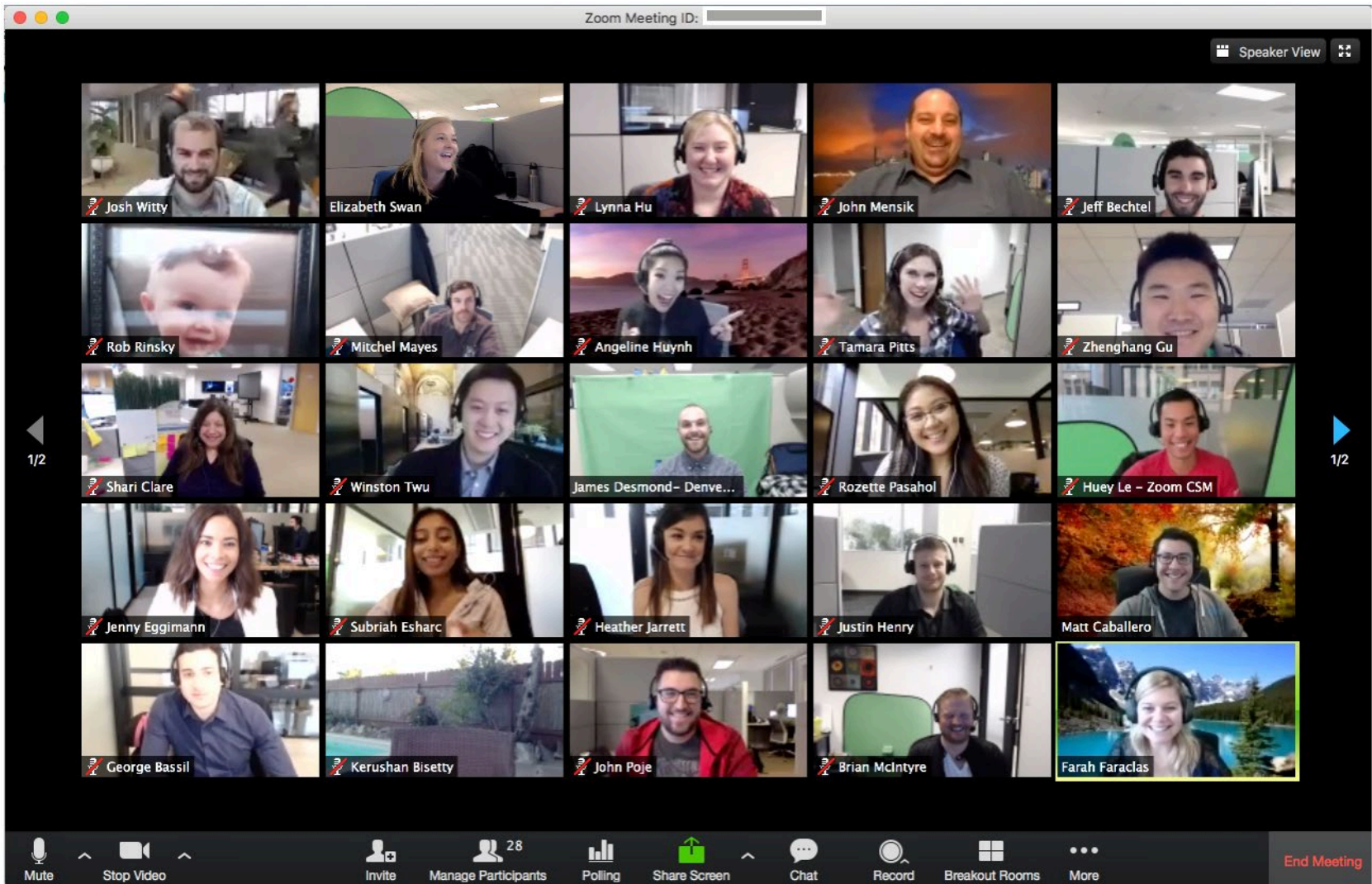
Sierra Windcutter Linesheet
Posted by Linda Fong

Sierra Windcutter Pitch Deck

Audio / Video Conferencing

- Real-time audio / video communications.
- Can also share screen and files
- Again! Not a global namespace.
- Proprietary protocols. Applications do not integrate!
- Skype, Google Hangouts, Zoom, Facebook workplace, WebEx, Gotomeeting

Zoom – Team meetings



Challenges of Enterprise Messaging

- Similar to email!
 - Governing Policies
 - Organization owns the platform – terms of use
- Additional Challenges
 - Services are often hosted in the cloud as SaaS
 - Good SLA's are necessary!