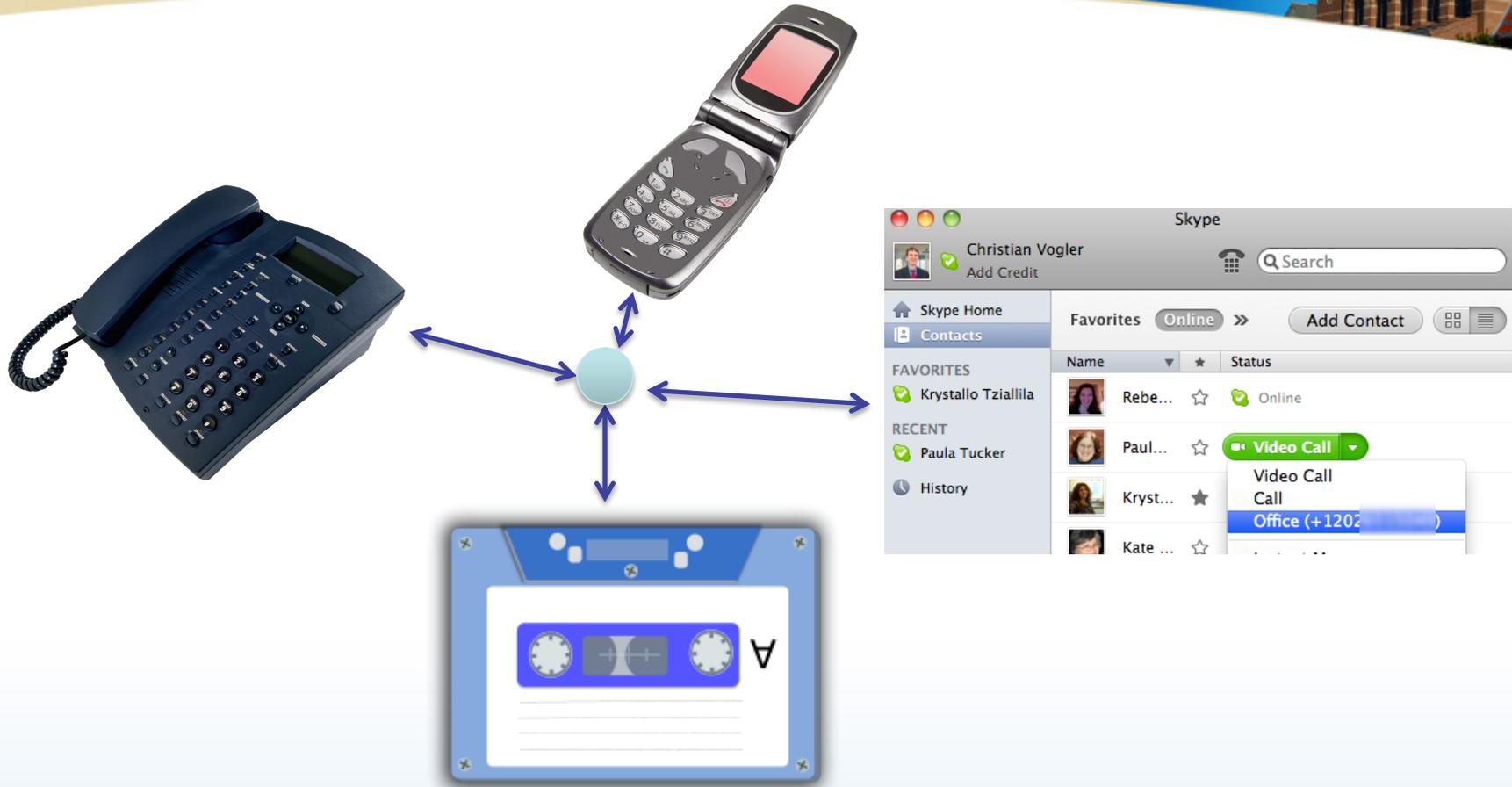




- **Interoperability** is a big barrier for us in the video calling world.
  - *Interoperability: devices from different vendors and providers work with each other.*
- See what hearing callers can do:

# Voice interoperability



Hearing callers can call each other with landline phones, mobile phones, Internet software, and leave messages via answering machines/voicemail. It just works.



- Video interoperability isn't as good
- Many VRS apps and phones still can't call each other
- We ran tests to find out -



- Tested devices, software and apps from 5 major VRS providers: Sorenson, ZVRS, Purple, SnapVRS, and Convo
- Tested **only** devices and software that are available to **new customers**





- Test live call from and to each device
- Test leaving message on answering machine
  - Press “reject call” on answering phone to force answering machine on
  - One limitation: Some phones may behave differently if you just let the call ring – but this would have taken too long
- 21 devices on each side, 882 calls total; took 2 weeks to complete



- Stand-alone VPs and computer software work better than mobile devices
- Live calls work better than leaving messages



- Sorenson:
  - The stand-alone nTouch VP is compatible with many non-Sorenson products
  - nTouch PC and the mobile clients do not work with non-Sorenson products
  - Stand-alone nTouch VP can leave messages on most non-Sorenson products, but not vice versa
  - If the answering machine does not work, you may get a busy signal – it does not always mean that the person is using the phone



- ZVRS:
  - Generally works well with most other products for live calls
  - Can take incoming messages from most products
  - Problems with leaving messages on Purple answering machines; bug has been reported and may already have been corrected



- Purple:
  - Works well with most other products for live calls
  - Some problems with taking messages on answering machine – calls ring, but never connect to the answering machine.
    - Possibly due to a problem with sharing an account across multiple devices in our test setup
  - Purple and Convo products have problems talking to each other
  - Purple iOS client has problems if the Purple user rejects a call – the call does not go to the answering machine. Bug has been reported.



- SnapVRS:
  - Tested only the Ojo stand-alone videophone
  - Generally works with other vendors' products
  - Can take incoming messages from most products, some problems with taking messages from Purple products



- Convo:
  - Can leave messages on most other products' answering machine
  - Cannot take incoming messages – no answering machine
  - Convo and Purple products have problems talking to each other

# Types of problems



- Videophone does not ring
  - ... you have no idea that someone called
- Black/green screen
  - ... the caller can't see you or vice versa
- Call gets disconnected
  - ... you can't finish your conversation
- Answering machine does not work
  - ... people can't leave messages for you



- Interoperability is worse than with standalone VPs and computer software
- Data bandwidth and data caps (2 GB is just 2-4 hours of calling time)
- With some iPhone and iPad VRS apps, the receiving side does not get the best video compression codec (H.264)
  - this means that they use twice as much data as other devices to get similar video quality
- It takes months before new Android devices are supported – if at all
- Some apps drain your batteries very quickly



- All this means:
  - We **still** need more than one videophone or software application to keep in touch with all of our friends and family
  - It is dangerous to rely on the answering machine, especially if you try to run a business via your videophone
  - We still don't have good ways to make mobile calls