

“Out of Office” Takes on a Whole New Meaning

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About Rob

Architecture Applications Manager

Rob's architectural career has been heavily influenced and weighted by technology. Starting in early 3D software, he became an early adopter to Building Information Modeling and all it brings with it. He has taught Revit at two local colleges and continues to have a strong interest in all that technology can do to enhance the architecture industry.

Rob is a huge **Chicago Blackhawks** fan...





About Moses

Associate Principal, Information Technology

Moses has managed the IT infrastructure at Ware Malcomb for nearly 20 years. He has helped the company grow from 3 offices and 75 employees to 22 offices and over 450 employees over that time. He is a member of the AECIT Leaders group and is passionate about finding new solutions and workflows that benefit the AEC Community.

Moses is a life-long **Oakland Raiders** fan...



“Out of Office” Takes on a Whole New Meaning

WAYS TO COLLABORATE

Technology changes constantly. We will take a look at some of the ways collaboration can happen today both within and outside of an office or even an organization.



IDENTIFY POTENTIAL OBSTACLES

Work collaboration through networks and internet has become complex with many factors. Identifying weak points and potential obstacles becomes a big part of ultimate success.



AUXILIARY TOOLS

Not just the software used to do the actual collaboration is essential. Frequently other (supporting) software becomes an important component of the entire process.



MAKING MORE INFORMED DECISIONS

The goal is that with the information presented in this session, you will be able to make better informed decisions about the solution perfect for your organization.



Montgomery Ward, Chicago





Montgomery Ward

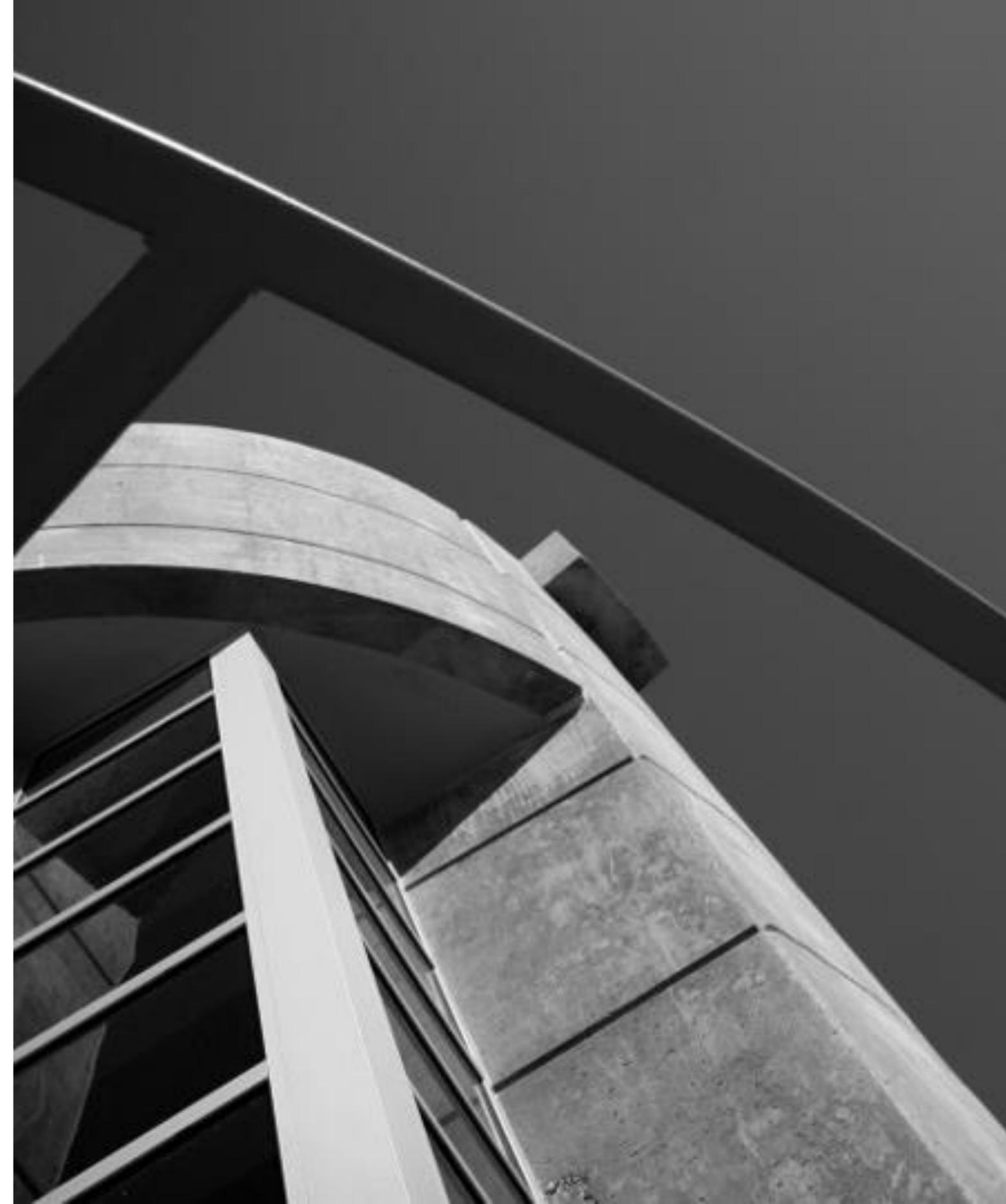
The oldest catalog order company in the United States had its headquarters built in Chicago, Illinois in 1907. The eight-story building housed 400,000sf (37,000m²) of office floor space. The faster information could be processed and delivered, the faster orders could be filled. The solution? Roller skates!



Ware Malcomb

This presentation is a case study of our company. The ideas and methods in this presentation are either things we have implemented or considered.

- Ware Malcomb was founded in 1972.
- We currently operate 22 offices of which 19 are in the United States, 2 are in Latin America, and 1 is in Canada.
- Currently Ware Malcomb employs over 450 people.
- Recent achievements include:
 - Recognized as an Inc. 5000 fastest-growing private company.
 - Recognized by Zweig Group as a Hot Firm and Best Firm to Work For
 - Engineering News-Record Top 500 Firms, Top 20 in A/E Firms
 - Interior Design Top 100 Giants, Top 30 Interior Design Firms



Ingredients for Collaboration



- Hardware
 - End User / Work Stations
 - Servers and Supportive Hardware
- ➔ • Connectivity
 - Internal Network
 - External Connection
- Software
 - Operating Systems
 - Production Applications
 - ➔ ○ Collaboration Software
 - ➔ • Auxiliary Software and Tools
 - Email
 - Phone or Voice-Over-IP (VOIP)
 - Video Conferencing
 - Chat Clients

Connectivity

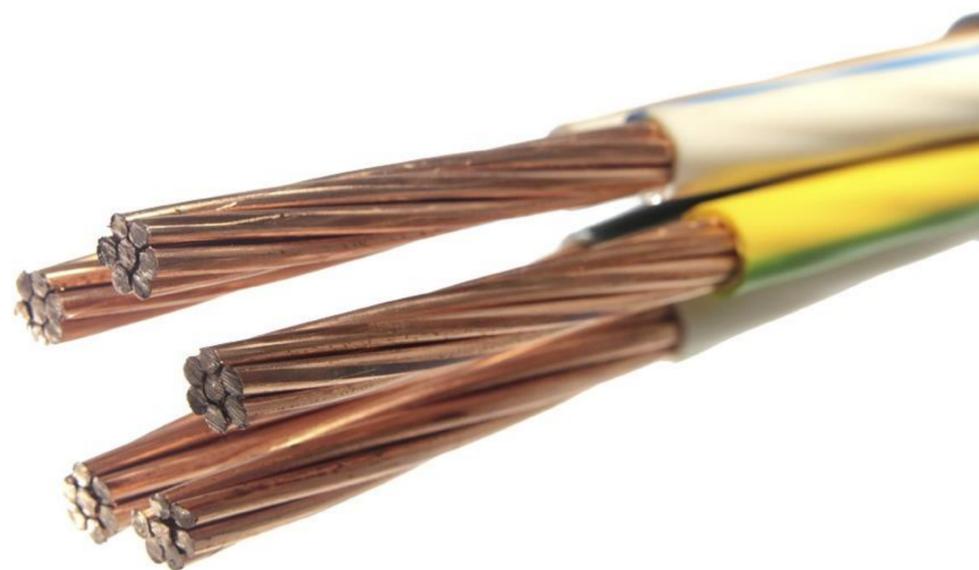
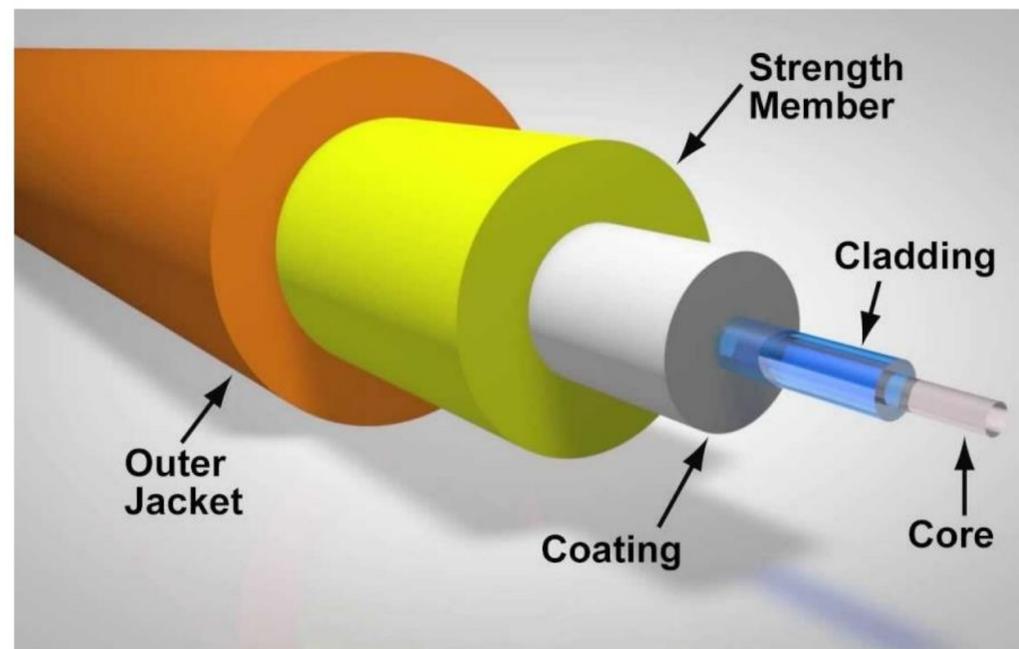
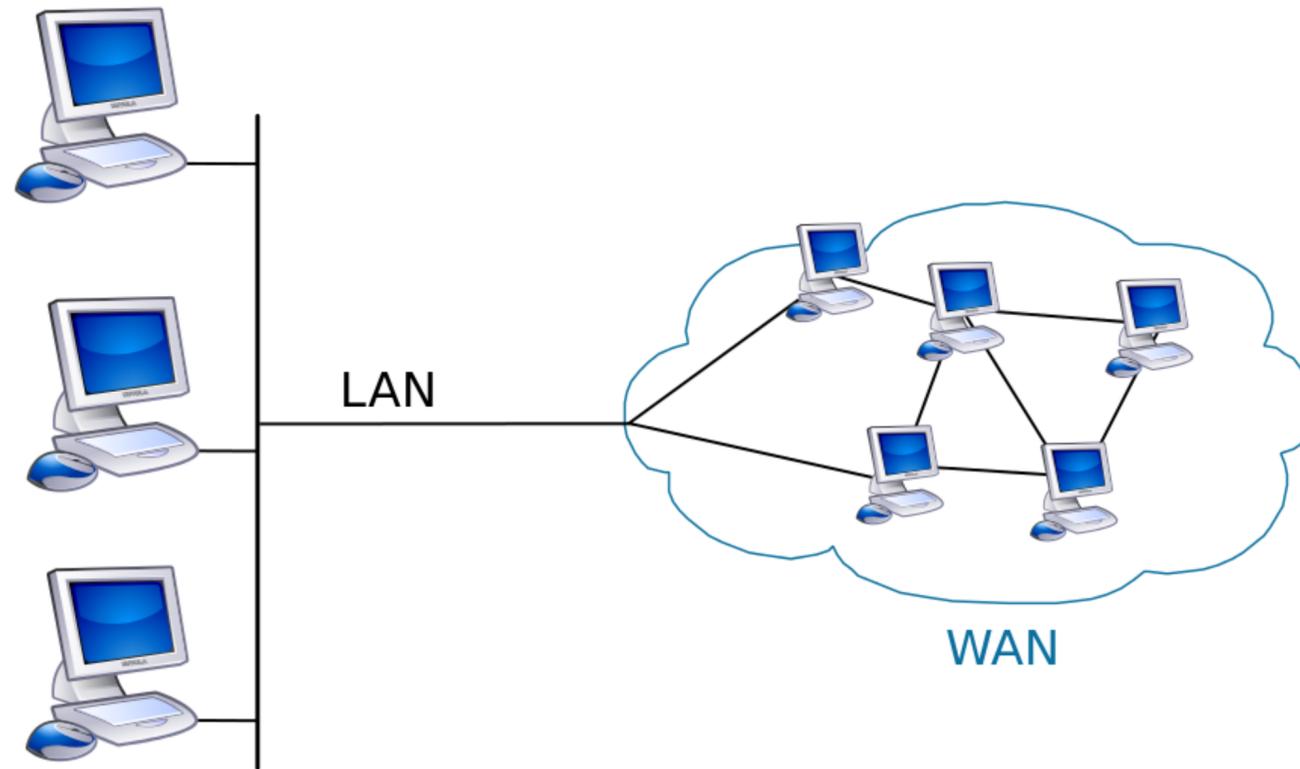


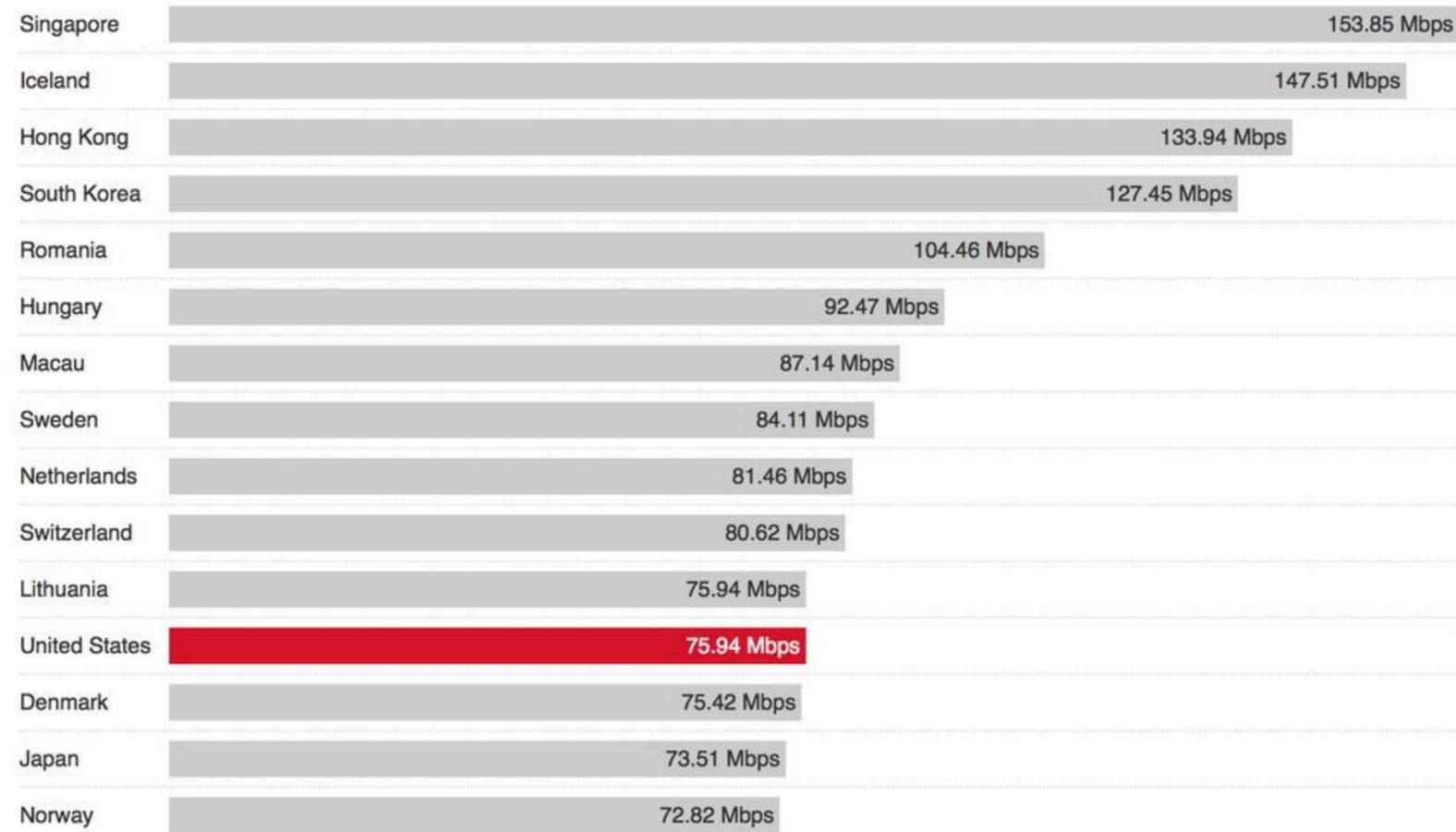
Image courtesy of Engineering Insider

- Internal Networks
 - LAN (Local Area Network)
 - Network Speed (Mbps/Gbps)
 - Switches and Servers
- External Networks
 - WAN (Wide Area Network)
 - Internet Speed (Mbps/Gbps)
 - Latencies (ms)
 - Infrastructure
 - Copper Wire
 - Fiber Optic
- Geography
 - National (Single Speed?)
 - International
 - Entry Points

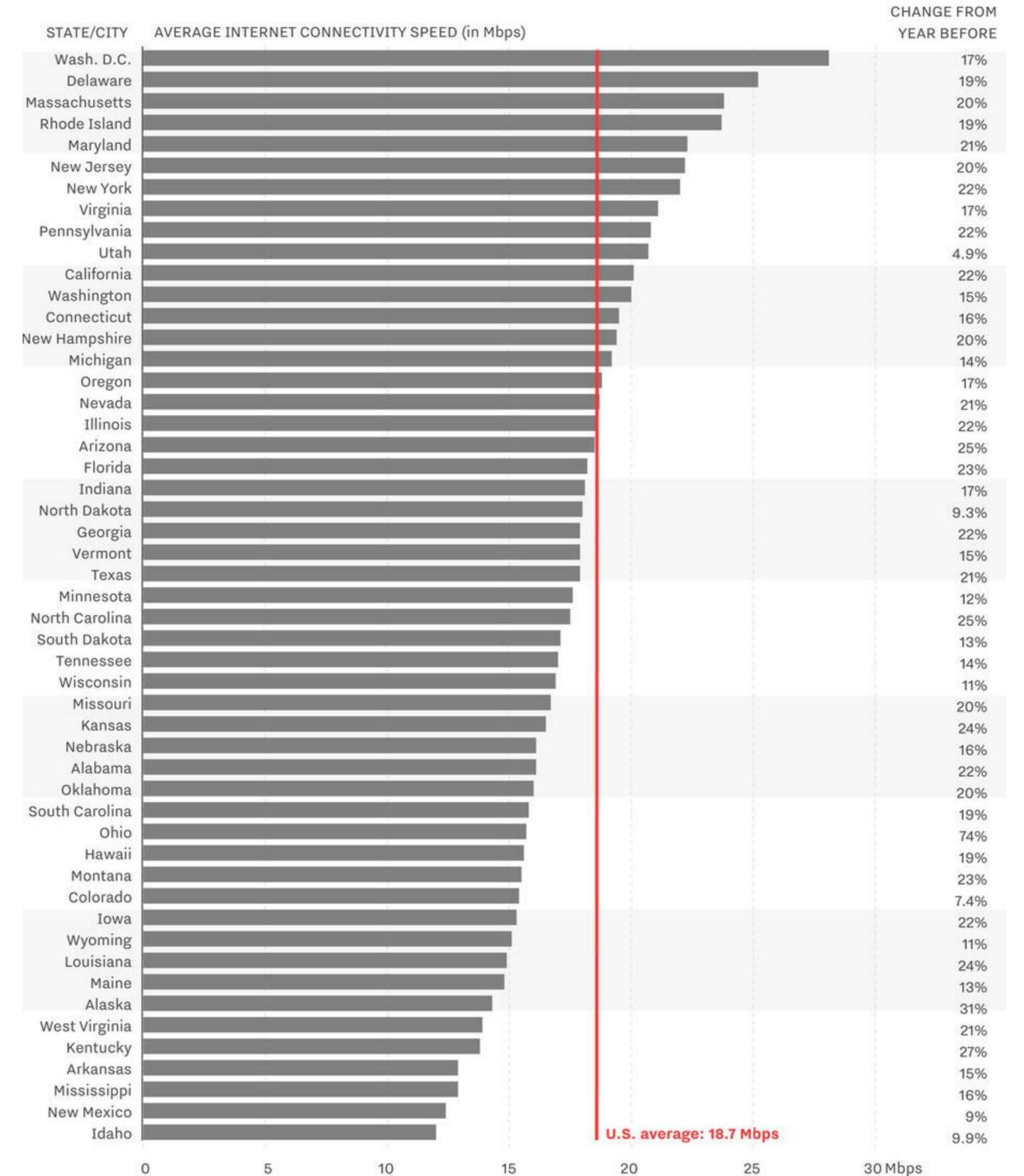


Internet Speeds

Countries with the fastest **broadband** download speeds



Source: Ookla



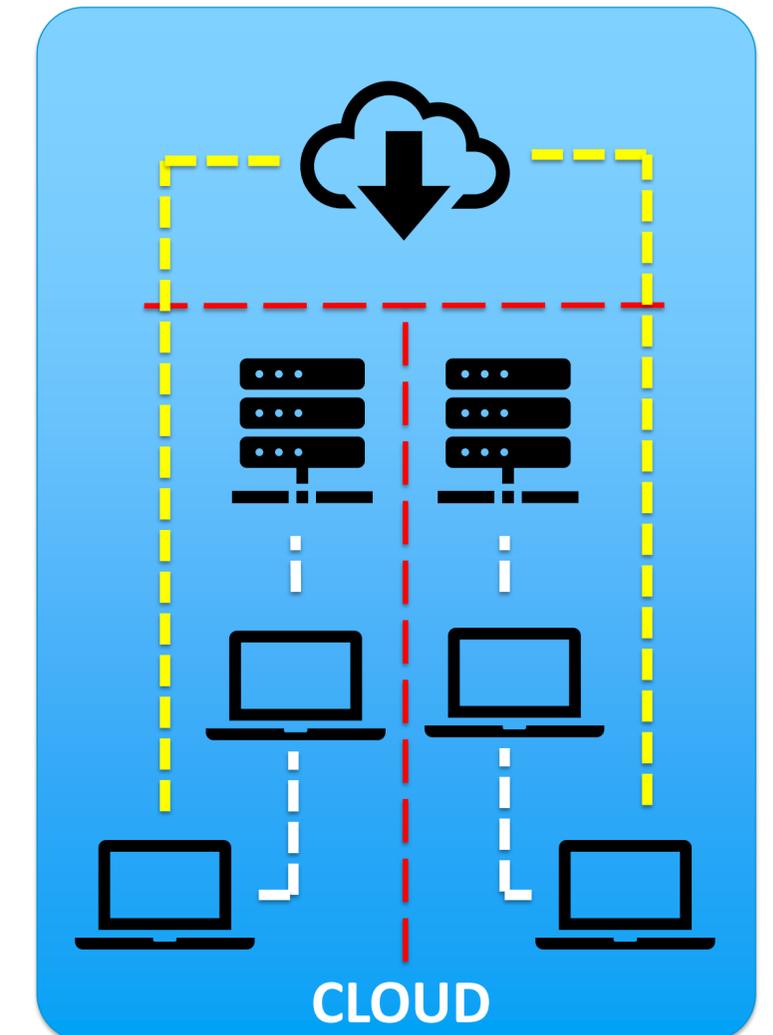
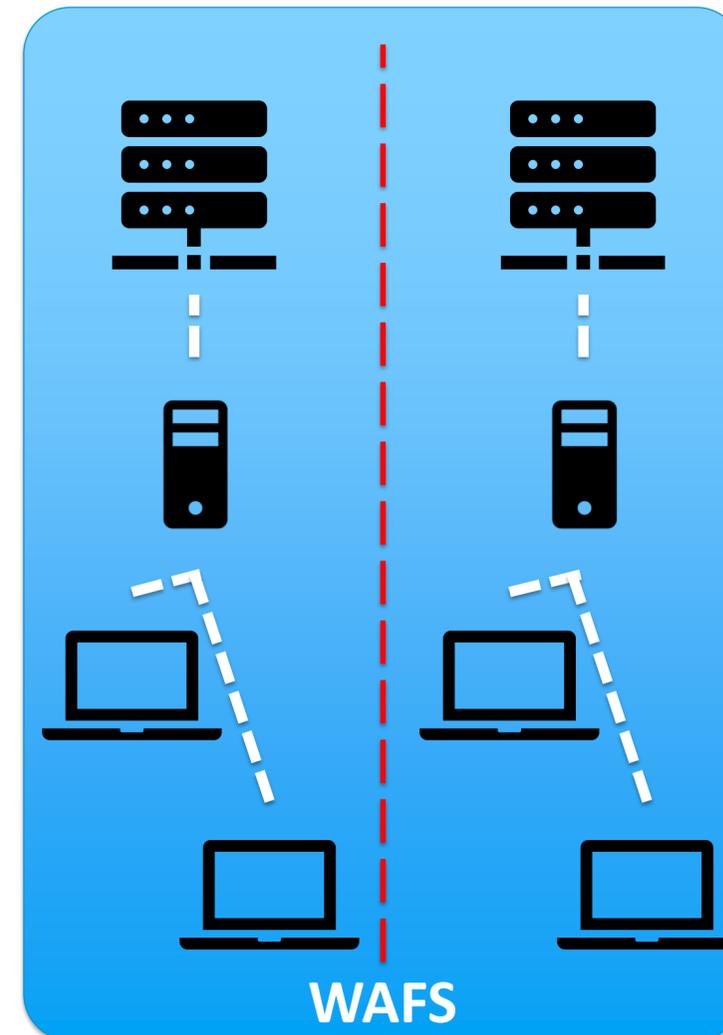
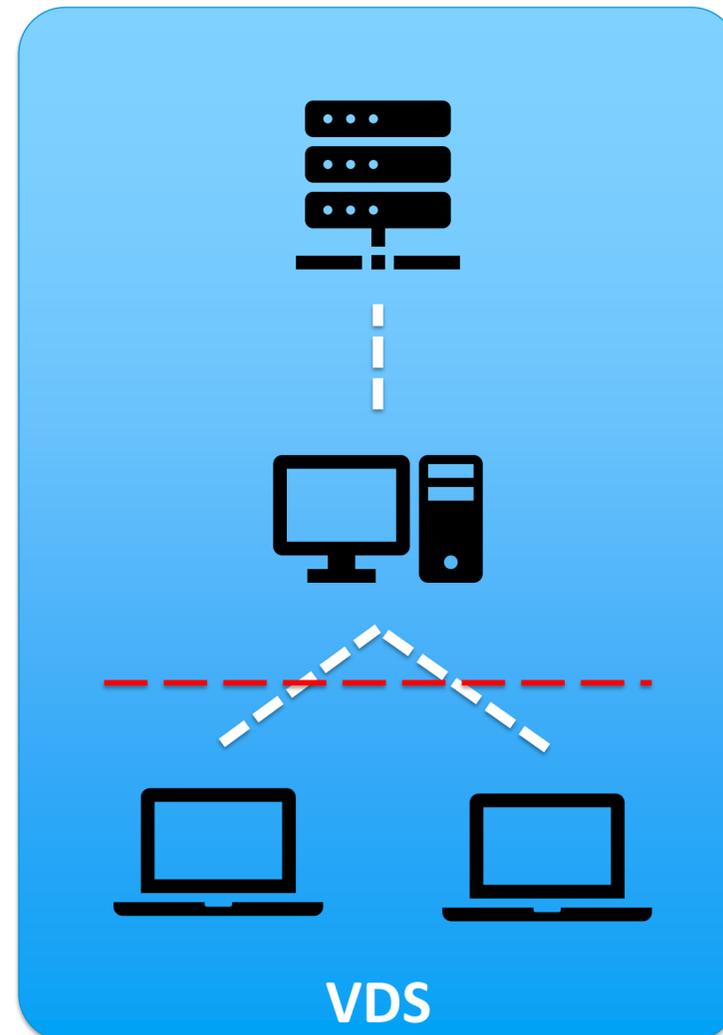
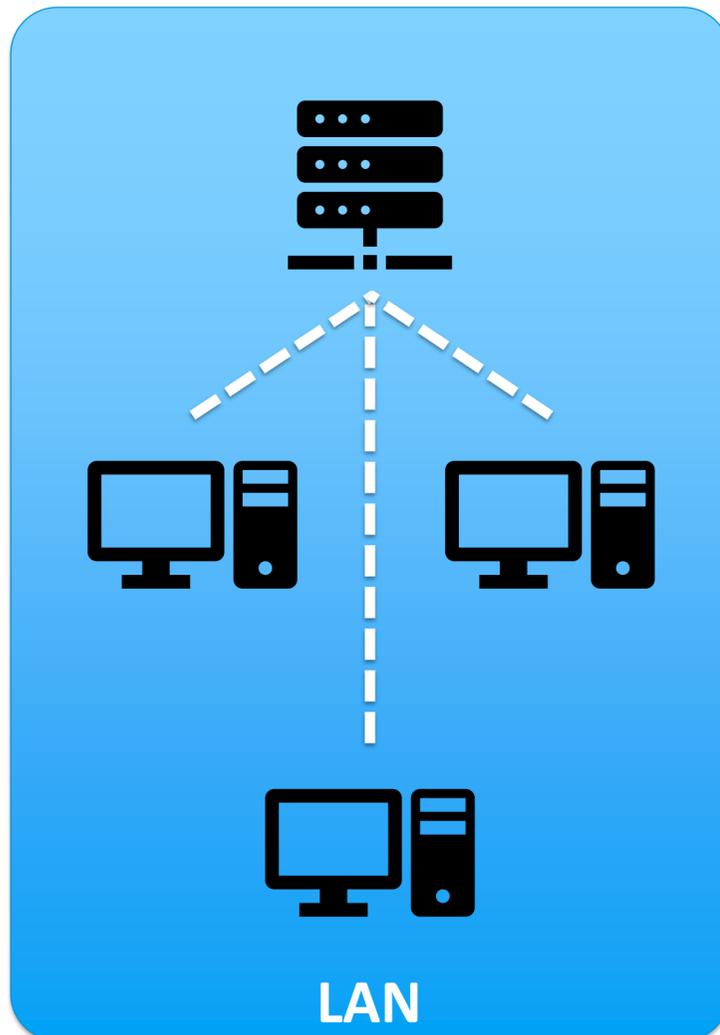
Source: Akamai | Data for Q1 2017, Internet Protocol version 4

Latencies

	Mexico ✖	Panama ✖	Toronto ✖
Atlanta ✖	● 45.139ms	● 63.428ms	● 38.428ms
Boston ✖	● 75.008ms	● 72.515ms	● 20.278ms
Chicago ✖	● 55.235ms	● 85.791ms	● 16.875ms
Denver ✖	● 47.004ms	● 100.224ms	● 35.418ms
Houston ✖	● 33.011ms	● 80.522ms	● 47.433ms
Los Angeles ✖	● 50.448ms	● 95.512ms	● 62.559ms
Miami ✖	● 53.826ms	● 48.119ms	● 39.891ms
New York ✖	● 67.987ms	● 69.929ms	● 22.774ms
Phoenix ✖	● 66.576ms	● 93.112ms	● 67.775ms
San Diego ✖	● 61.607ms	● 95.219ms	● 78.012ms
San Francisco ✖	● 59.045ms	● 103.303ms	● 68.383ms
Seattle ✖	● 69.379ms	● 113.579ms	● 58.002ms

Collaboration Methods

- **Local Area Network (LAN)** - Typically only used within one geographical area/office.
- **Virtual Desktop Infrastructure (VDS)** - 'Working computers' are logged into remotely by 'terminals'.
- **Wide Area File Services (WAFS)** - Duplicated data with only 'delta' being transmitted.
- **Cloud Collaboration** - Solutions like Autodesk BIM 360 Design (C4R / BIM 360 Team).



Collaboration Methods

SOLUTION	PRO 	CON 
Local Area Network	<ul style="list-style-type: none"> • Easy to set up • Relatively low cost 	<ul style="list-style-type: none"> • No collaboration outside
Virtual Desktop Infrastructure	<ul style="list-style-type: none"> • Scale performance at the server end • Local members / hardware can be lighter 	<ul style="list-style-type: none"> • Highly dependent on internet speeds / latencies • Relatively high cost
Wide Area File Services	<ul style="list-style-type: none"> • Modernizing infrastructure • Data protection • Better collaboration • Best for office-to-office 	<ul style="list-style-type: none"> • Relatively high cost • Recovery time for hardware
Cloud Collaboration	<ul style="list-style-type: none"> • Speed and access for single-file collaboration is best • Easier access for consultants 	<ul style="list-style-type: none"> • Data security • Local machines need to have sufficient power

Collaboration Methods

To Cloud or not to Cloud...



When / how do we make the decision to use a specific workflow for a project?

- Size of the project and/or potential size of files?
- Deadlines (short-term or long-term)?
- Number of team members required?
- Where are team members located?
- Level of sophistication?
- Consultants on board and level of their collaboration?
- Likelihood of any of the above to change over the duration of the project?



“Management means measurement,
and a failure to measure is a failure
to manage.”

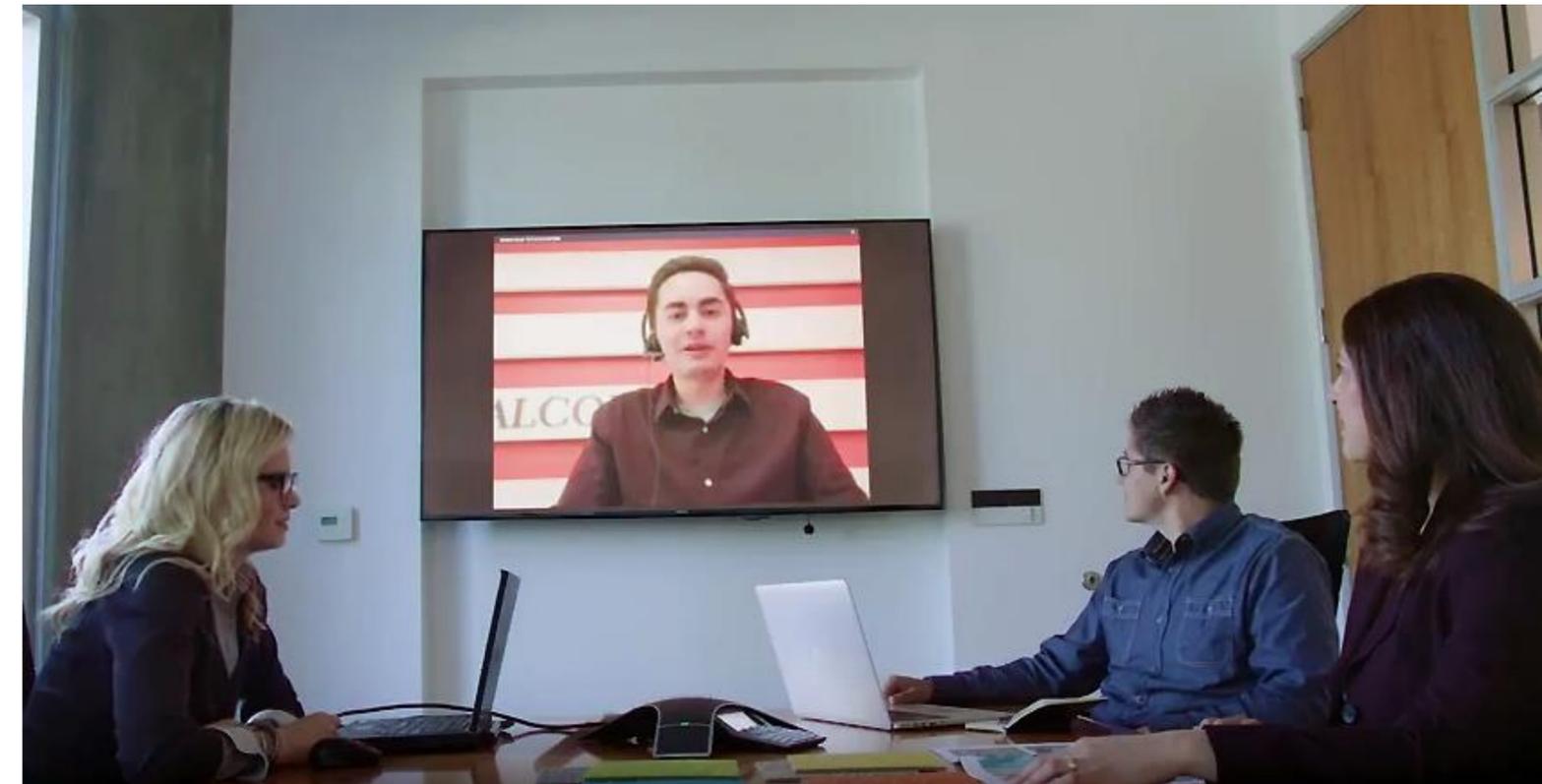
Martin L. Abbott, The Art of Scalability

Auxiliary Tools

The collaboration on a project does not begin and end with Revit or the production tools and software. We have found that many tools can complement this process and become important parts of collaboration.

- Email
- Phone / Voice Over IP (VOIP)
- Video Conferencing
- Chat Clients

(In our hand out we've listed numerous solutions but this industry segment changes so rapidly that it is difficult to keep an up-to-date list.)



Auxiliary Tools

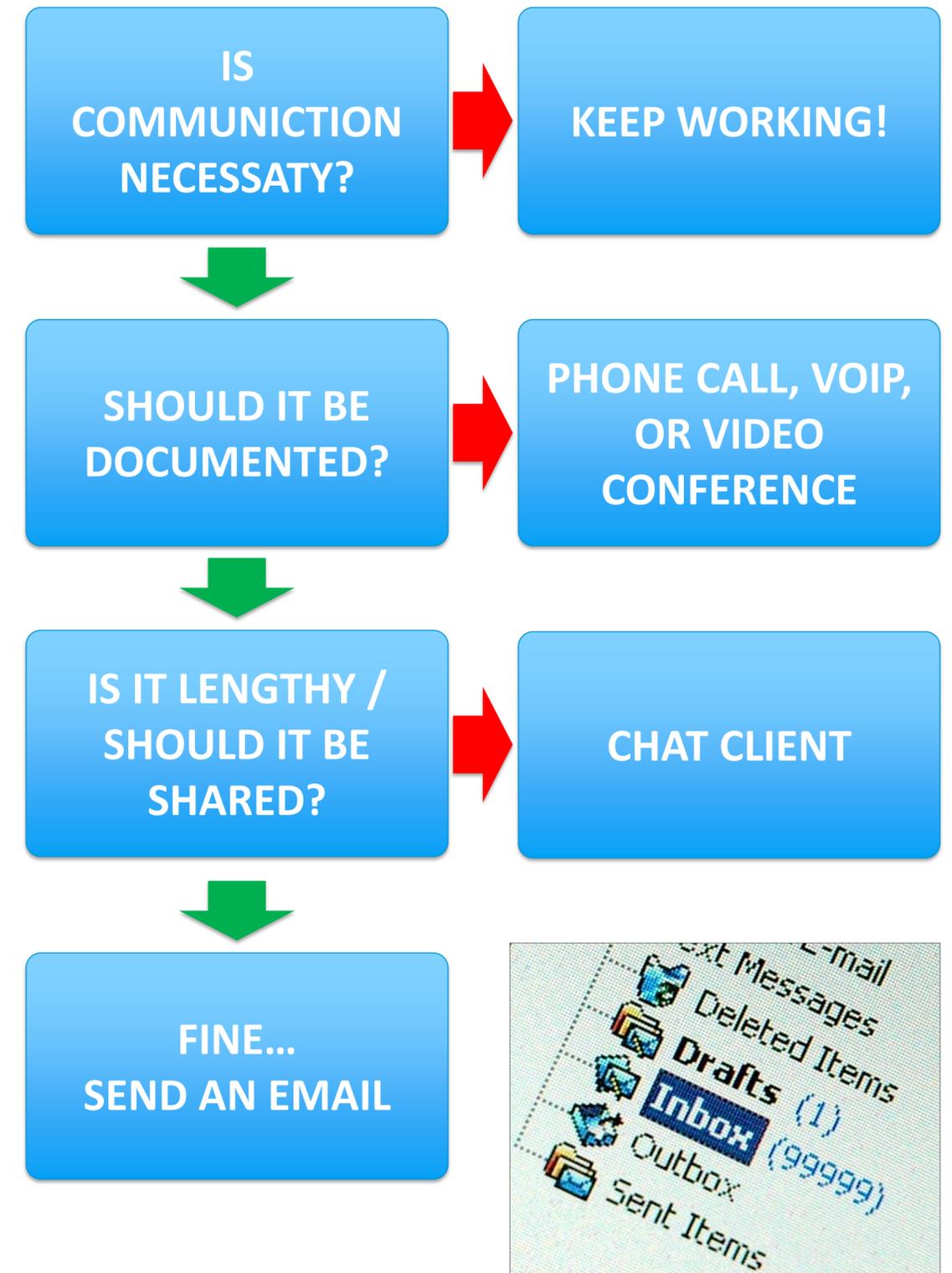
We have found cutting down on email can be a big productivity booster. A few interesting things about email:

- 269 billion emails are sent per day (January 2017)
- 149,513 emails are sent each minute (August 2017)
- 121 average emails for an office worker per day (January 2015)
- 42% of Americans admit checking their email in the bathroom.

Some more serious things about email:

- All email (and any other digital communication) is part of the legal documentation of a project and thus is subject to legal subpoenas.
- Average time spent on work email per week: 13 hours.
- Average percentage of the work week dedicated to email: 28%.

Statistics courtesy of Dynamic Signal

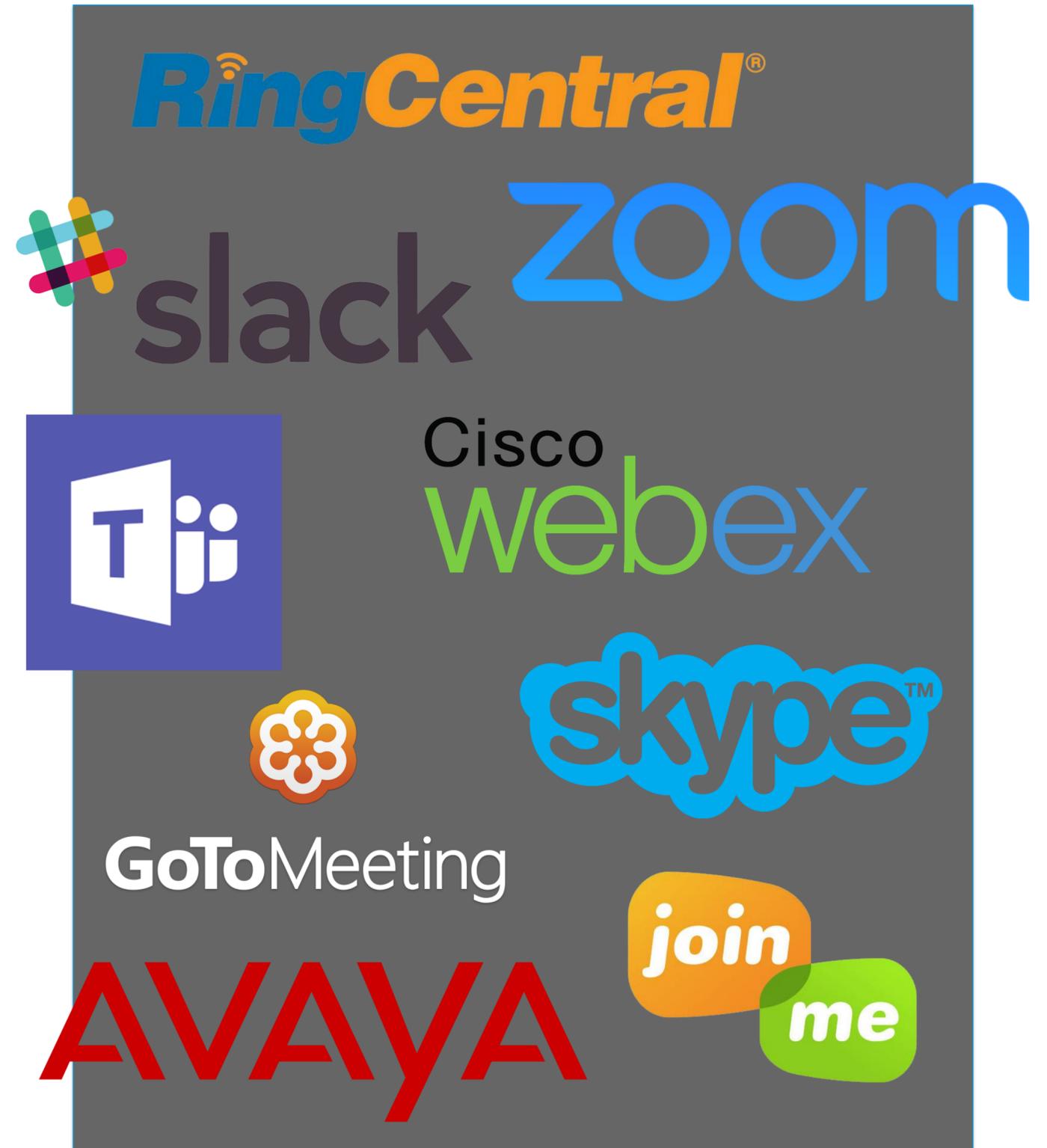


Auxiliary Tools

Many tools merge. With VOIP and Video Conferencing becoming more prominent, almost everything is merging into one, digital platform. Keeping everything organized is key.

Pitfalls to watch out for:

- Creating too many applications for users to have to learn/maintain
- Dispersing project information in many different areas, making management of a project difficult.
- Failing to set standards as to what communication is done where.





Conclusion

- Do plenty of research. Knowledge is power.
- Create the right setup for the work at hand; there is no “one size fits all” solution.
- Plan for the future. Make sure your solutions are scalable.
- Have the proper support. Every system *will* fail.
- Train your users.
- Eat your vegetables!

Thank You!



We welcome you to look for Ware Malcomb in any of these Social Media channels:





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