

## Have Cart, Will Stream



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## First, I'll provide some background information about me.

- 20+ years at RIT all associated with the software engineering department/program
- Coordinator for Software Engineering Senior Projects since 2002
- Software Engineering Senior Project
  - *Around 25 software-intensive projects per year*
  - *2/3 to 3/4 of sponsors are not affiliated with RIT*
  - *4 or 5 students per project team*
  - *50% of project sponsors remote from Rochester area*



**Working as a fully co-located team is ideal but it can not always be accomplished.**

- Students can't meet regularly as a team
  - *Stay in contact*
  - *Regular updates on activities*
  - *Collaborative activities*
  - *Artifact repository*
- Project sponsors are remote
  - *Weekly meetings*
  - *Project reviews and presentations*

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**Online collaborative tools can help bridge this time-space gap.**

- Project planning – simple project tracking with task cards and lists
  - [Trello](#)
  - *Pivotal Tracker*
- Meeting planning
  - [Doodle](#)
  - *When2Meet*
- Artifact repository
  - *Google drive (docs, sheets, slides)*
  - [GitHub](#)
  - *Homebrew like [RIT KGCOE Edge](#)*

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## There are tools that facilitate synchronous and semi-synchronous communication.

- Intra-team communication – messaging, voice, links to other tools
  - **Slack**
    - ♦ Use desktop or phone app to access multiple workspaces
    - ♦ Create team with multiple workspaces
  - **Discord** – *popular with computer gaming folks; adds voice to text messaging*
- Distributed meetings – online audio and video meetings, share screen
  - **Google Hangouts**
  - **Skype**
  - **Joinme**
  - **Webex**
  - **BlueJeans**

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## First, we will explore a Slack workspace for team communication.

- [havecartwillstream.slack.com](https://havecartwillstream.slack.com)
  - ***Respond to invite or login to Slack and search for workspace***
  - ***Post a message in #general***
  - ***Reply to a message by starting a thread – mouse over message, use word bubble in popup toolbar***
  - ***Send a message in a private channel***
  - ***Notify @everyone, a #channel or an @individual***

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## Trello is a streamlined planning tool.

- Have Cart, Will Stream Trello board
  - *Respond to invite or get link in Slack workspace #trello-alert channel.*
  - *Create lists*
  - *Create cards*
  - *Create checklists with items*
  - *Add comment to card*
  - *Assign responsible person*
  - *Move cards in list, to another list*
  - *See notices in Slack channel*

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## Google Hangouts provides an easy mechanism to hold a meeting with distributed attendees.

- <https://hangouts.google.com>
  - *Break up into groups of three or four*
  - *Sign in to hangouts page*
  - *One person starts a video call*
  - *Allow use of microphone and video*
  - *Copy sharing link to Slack workspace*
  - *Others join the video call*
  - *Display switches to current speaker*
  - *Share the screen: three dots menu → Share screen*

To prevent audio feedback, turn your speaker way down, or mute it, but keep you microphone live.

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## Streaming cart provides basic video capture, mixing, and streaming.

- Mid-range Windows PC with vMix software
  - *Allows picture-in-picture image, i.e. projected image and presenter*
  - *Allows display of title slides*
- Dual video capture: HD camera, projector image
  - *USB webcam capture as backup for projector*

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## YouTube is the easiest way to stream a presentation for general viewing.

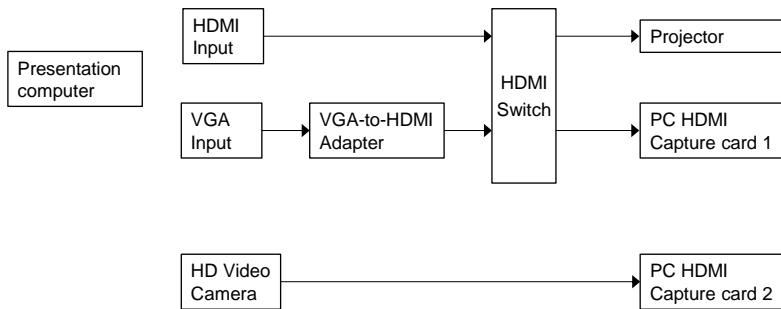
- You can do it as an individual or create an organization that you manage through your Google account.
- Stream now, or create an event ahead of time.
  - *Some instructions and hints are in the notes.*
- Our senior project presentations page
  - <http://www.se.rit.edu/~swen-561/Presentations.html>
- <http://www.se.rit.edu/~jrv/capstone.html>

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**This arrangement lets you easily select either type of computer output for projection and streaming.**



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**Questions?**

**Continued play time  
with any of this stuff.**

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## Streaming Cart materials list

Item	Info	Cost
Cart	<a href="#">Two shelves, nothing fancy</a> ; repurposed viewgraph projector cart	\$80
Computer	Medium power Windows desktop PC	\$1500
	<a href="#">Feb Smart N600 Dual Band WiFi card</a>	\$30
	<a href="#">Blackmagic Design DeckLink HDMI capture card</a>	\$145
	<a href="#">Magewell Pro Capture Dual HDMI capture card</a>	\$500
Software	<a href="#">vMix HD</a>	\$350
HD video camera	<a href="#">Canon Vixia HF G20</a> (refurbished); needs live hdmi output	\$700
	<a href="#">Revo VRS-LANC Wired remote for LANC control</a>	\$29
	<a href="#">LANC 10' remote extension cord</a>	\$11
Pan-Tilt head	<a href="#">Bescor Motorized Pan &amp; Tilt Head with power supply and extension cord</a>	\$120
	4 – <a href="#">AA rechargeable batteries and charger</a>	\$24
HD Webcam	<a href="#">Logitech C930e</a> 1080p video webcam	\$75
Microphones	<a href="#">Revolabs Dual Channel Wireless Microphone System Receiver 02-HDDUAL-NM</a>	\$600
	<a href="#">Revolabs 02-Hddualchg-11 Charger Base</a>	\$113
	<a href="#">Revolabs 01-HDEXEMIC-11 HD Wearable Mic</a>	\$271
	<a href="#">Revolabs 01-HDTBLMIC-DR-11 Directional Tabletop Mic</a>	\$283
Tripods	2 – <a href="#">AmazonBasics 60-inch lightweight</a>	\$48
Adapters	<a href="#">VGA to HDMI</a>	\$20
	<a href="#">Mini-displayport to HDMI</a>	\$5
	<a href="#">Displayport to HDMI</a>	\$4
Cables	<a href="#">HDMI – HDMI</a> : 2 - 1 to 3'; 15 to 20'	\$23
	<a href="#">Blackbird HDMI 2x2 Matrix switch</a>	\$34
	<a href="#">USB extension cable</a>	\$2
	<a href="#">Ethernet cable with extension coupler</a>	\$10
Misc	Power strip for cart	
	Extension cord	
	Triple power outlet	
	Roll of duct tape	
	<b>Total without miscellaneous</b>	<b>\$5177</b>

### Ways to trim costs:

- Reduced capability mixing software (-\$200 to -\$350)
- Less expensive wireless microphones (-\$1,100)
- Video capture – want two video stream
  - Two USB webcams (-\$1310) (no HD video camera or capture cards)
  - Less expensive HD video camera, no pan-tilt head (-\$500)
  - Two Blackmagic cards might work together (-\$210)
  - Use only Magewell card (-\$145)

## Instructions for setting up a YouTube event

1. Login to YouTube
2. Go to your organization, if you have created one.
3. Find Creator Studio (if no button, try dropdown menu under your icon in upper right)
4. Pull down Live Streaming from leftside menu
5. If you want to just start streaming, select Stream Now
6. To setup a future event, select Events
7. Click New live event in upper right.
8. On the basic tab, complete the information about this event including time
9. The advanced tab has options that you can adjust. The defaults work for most situations.
10. Click Create event in the lower right. This will take you to the Ingestion Settings tab.
11. You can add a thumbnail image that will be displayed until you start the stream.
12. If you will be streaming multiple times, consider using a Reusable stream key. Otherwise, a Single-use stream key will work.
13. You will now see the information that you need to put into the vMix software streaming dialog box to setup the stream.
14. You can get the link to the stream for others to view in the View on Watch Page button.
15. Click Save changes in the upper right of the page.
16. When you are ready to stream, put the parameters into the vMix software, and click the Stream button. You can also do a local recording of the stream to the hard disk of the PC.
17. Go to the YouTube Live Control Room tab.
18. You will see the stream status indication.
19. To actually start streaming, you must first click Preview, and then the Start streaming.
20. There is a variable delay (~30 seconds) between a live action and when the action appears in the stream.
21. When you are done, click Stop streaming. Stop the stream in the vMix software.

After some post-processing, the video can be downloaded from YouTube in the Videos list under Video Manager in the left side menu. You can also delete the video from here.