APIs and Open Source
Roundtable

RESNET 2018

February 25, 2018

Agenda

Rater Pro Background

Introductions

3 Discussion Items

1. Planned "Web Service API" 3rd party systems (1 hour)

2. Planned "Testing Equipment API" (15 mins)

3. Open Source exploration (30 mins)

RaterPRO's Goals

- Provide a tool that facilitates the collection of high-quality field data during the pre-drywall and final inspections.

- This helps increase the value, and reduce the cost, of a high-quality third-party rating.

- Promote increased adoption of high-quality ratings across the industry.

6 Key Features

1. Ability to verify both ENERGY STAR and HERS jobs

2. Cloud-based with ability to work offline

3. Able to import proposed ratings from HERS software

4. Able to export confirmed ratings back to HERS software

5. Capable of capturing robust data

6. Voluntary and free

RaterPRO's Role in the Market

- We strongly believe in digital inspection apps and would love to see them universally adopted

- There are lots of great alternatives available in the market, and more to come

- RaterPRO is intended to offer a *baseline* feature set that we consider the *minimum* for a modern inspection platform

- A free baseline makes it possible for everyone to participate in this digital future

- EPA is exploring ways for 3rd party developers to leverage RaterPRO for core rating functions while adding their own 'special sauce' on top.

Announcing:

Public Beta

Beginning March, 2018

The Year Ahead

At RESNET 2019 you can expect:

- **Dropping the 'Beta' label**
  - Successful history of day-to-day use by early adopters
  - Be ready for widespread adoption
- **A 3rd-Party API**
  - Will allow 3rd party systems to integrate with RaterPRO
  - Had a great discussion at pre-conference session Sunday
  - Interested developers should contact Elliot (Seibert.Elliot@epa.gov)
- **Much more news about RaterPRO's future**

Goals for Today's Roundtable Discussion

Explore options to integrate with 3rd-party systems in order to:

- **Improve quality assurance**

- **Expand RaterPRO deployment**

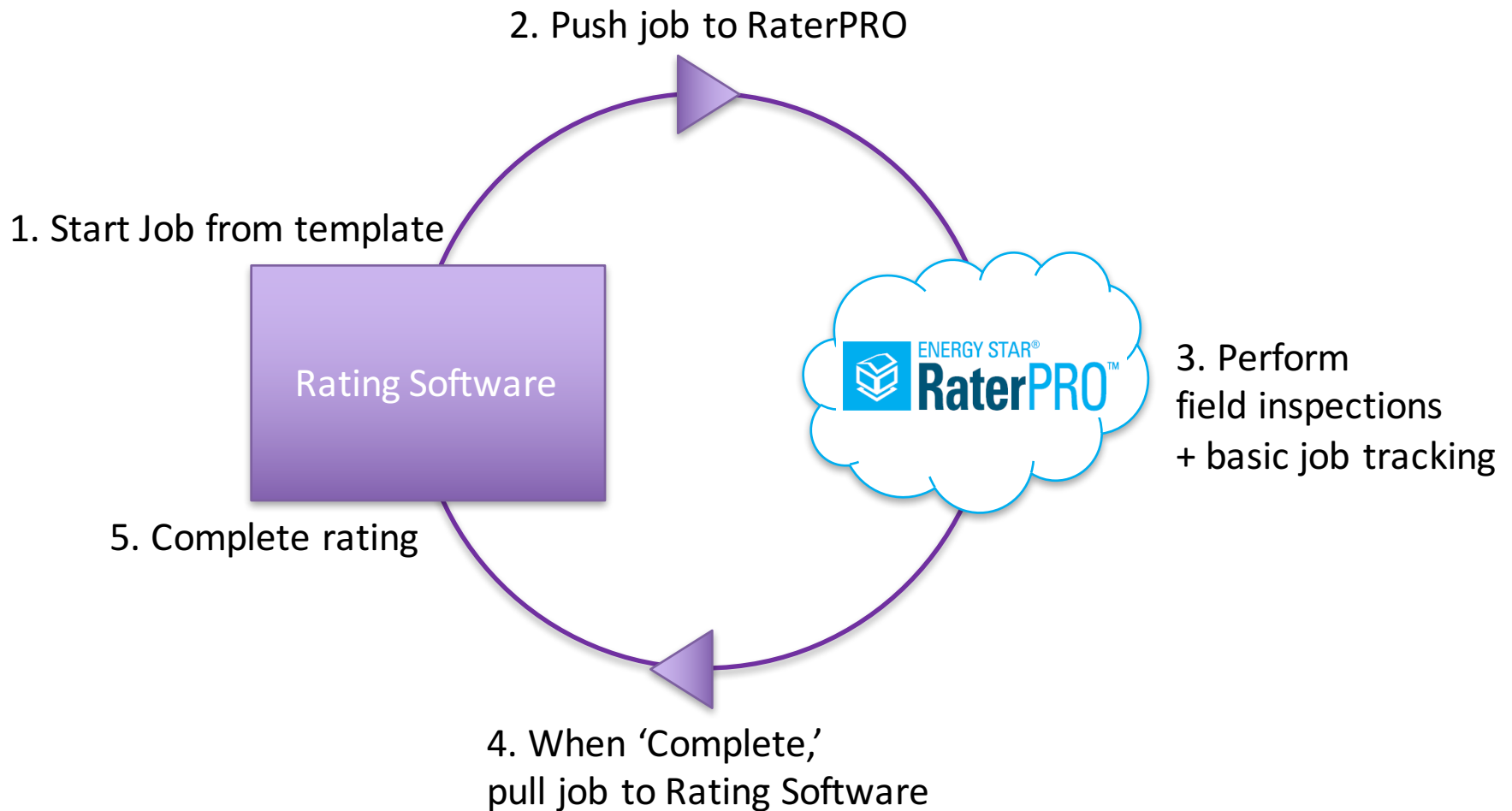- **Allow industry to customize and build on top of RaterPRO**

Introductions

Web Service API

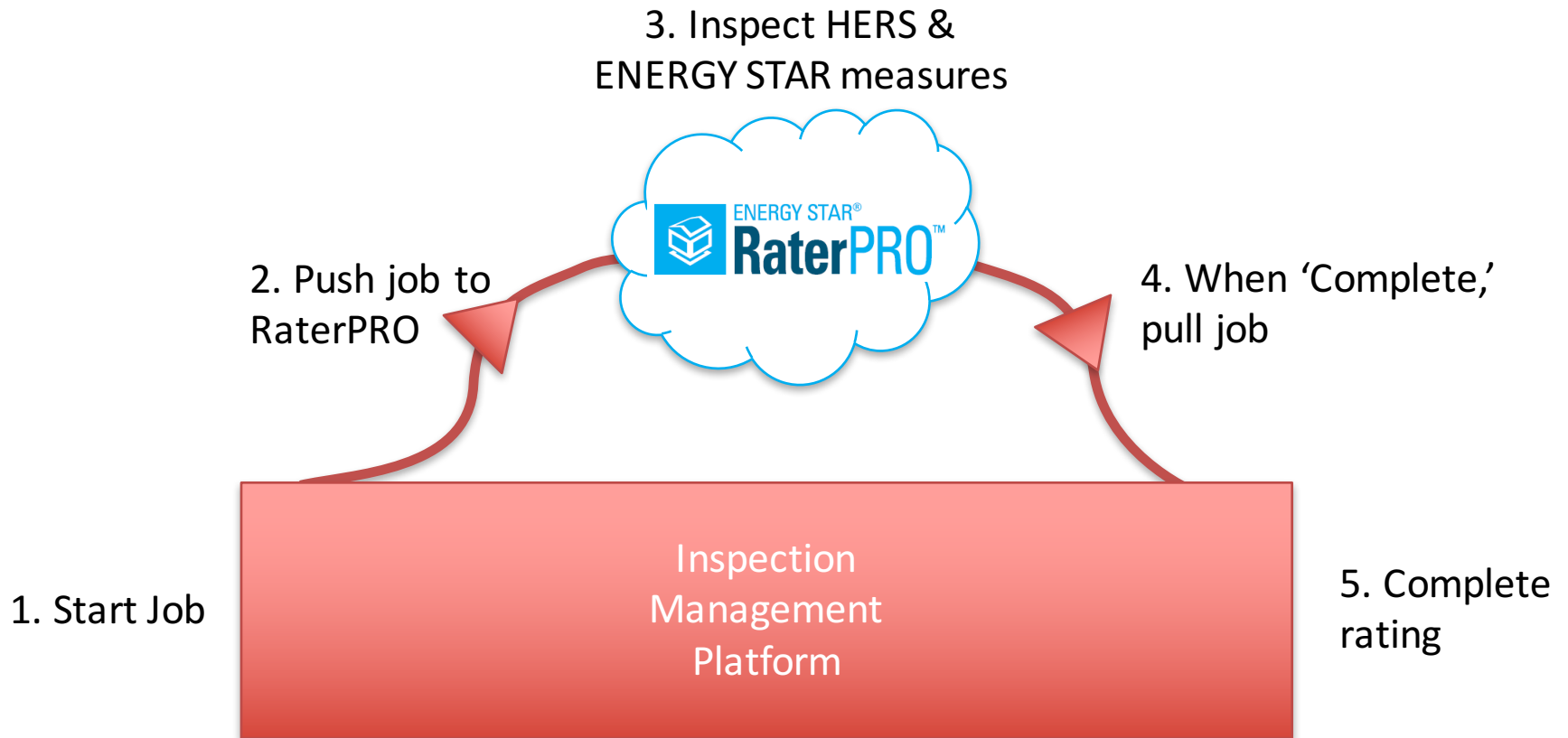# Uses

- Let 3rd-party systems create jobs and retrieve jobs

- Allow easy sharing of job and quality assurance data for customized or creative uses

- Enable seamless rating file workflow (vs. clunky import/export of XML to desktop)

Use Case: Rating Software

2. Push job to RaterPRO

1. Start Job from template

Rating Software

ENERGY STAR®
RaterPRO™

3. Perform
field inspections
+ basic job tracking

5. Complete rating

4. When 'Complete,'
pull job to Rating Software

Use Case: Inspection Management Platform

3. Inspect HERS &
ENERGY STAR measures

ENERGY STAR®
RaterPRO™

2. Push job to
RaterPRO

4. When 'Complete,'
pull job

1. Start Job

Inspection
Management
Platform

5. Complete
rating

Use Case: Custom Reporting

1. Start Job within RaterPRO

2. Perform field inspection

3. Pull job on demand

Custom Reporting Software

4. Generate custom report

Status

- Currently at conceptual phase

- Next step: draft specification by summer 2018

- Opportunity for input and changes

- Aiming for availability by early 2019

How will it work?

- 3rd-party registration with EPA

- Rating company would allow 3rd-party access in RaterPRO settings

- Leader/Follower relationship: 3rd-party system is the Leader, RaterPRO is the Follower.

- 3rd-Party could push/pull jobs into and out of RaterPRO

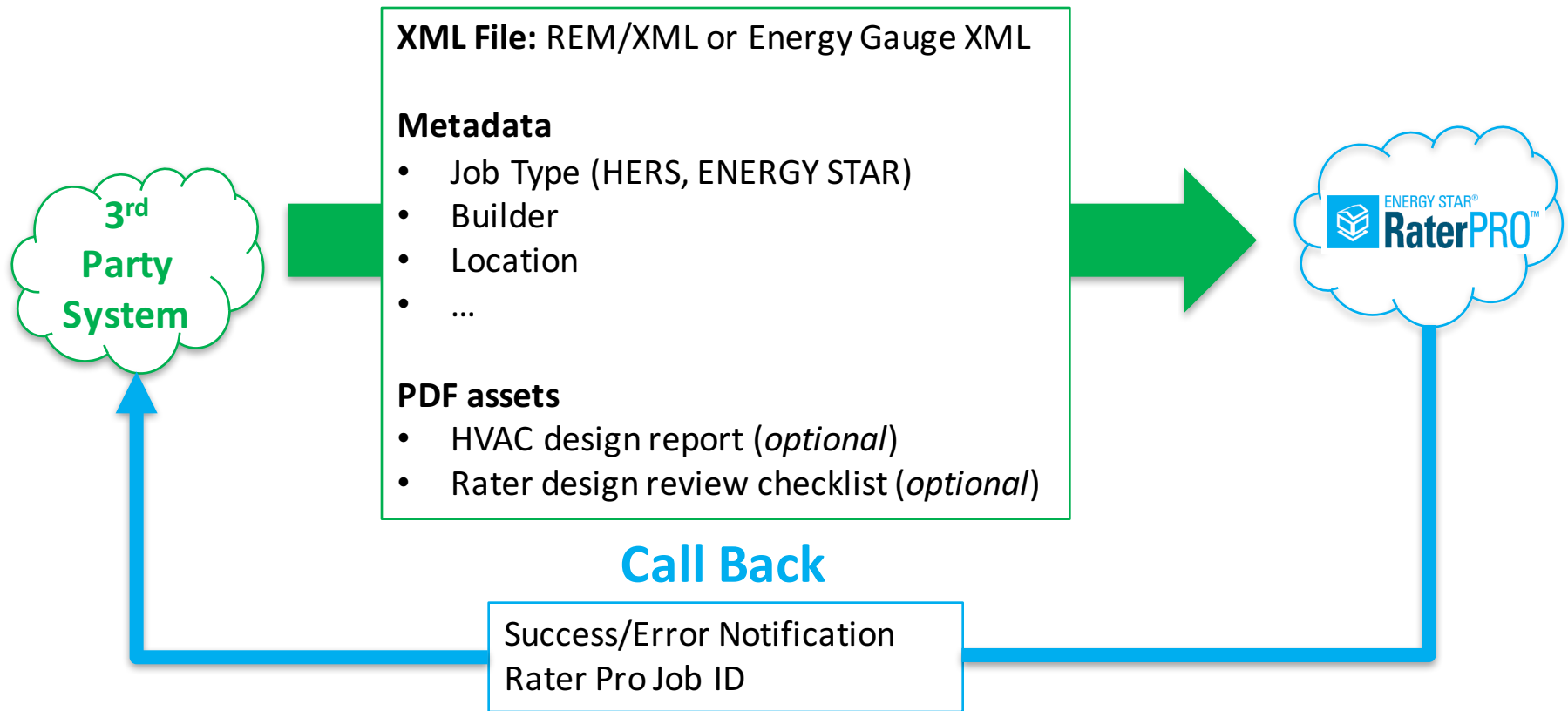- RaterPRO would also publish summary list of jobs by status
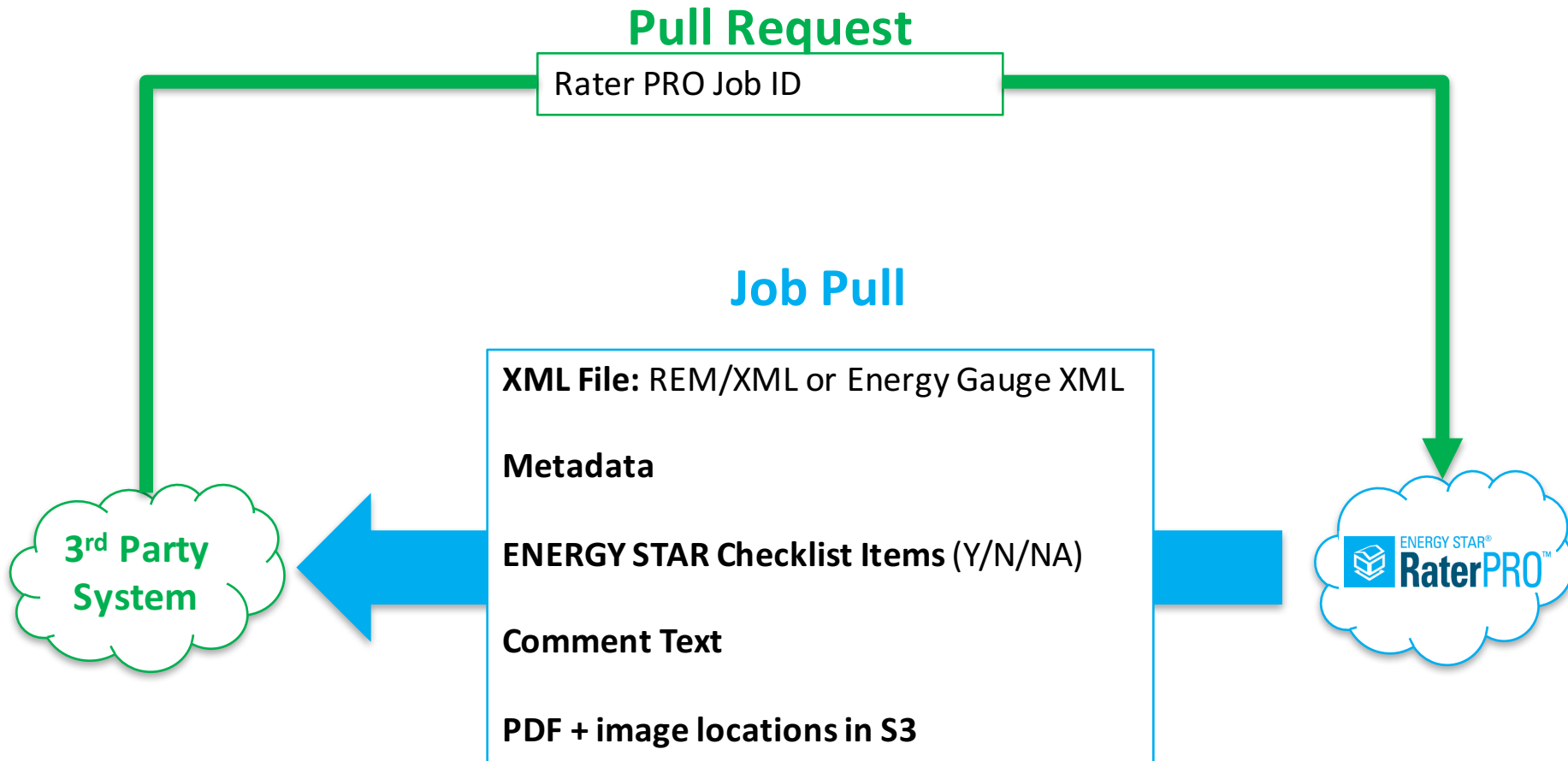
Registration and Authorization

- Rater Company Admin would generate a unique API key for an ENERGY STAR partnered 3rd party service in the RaterPRO admin website

- Rater Company Admin would configure their settings in the 3rd party service with that API Key

- All API calls from the 3rd party service would include the API Key in the request headers

- Keys can be revoked by the Rater Company Admin in the RaterPRO admin website if need be.

Push Job

Push Job

XML File: REM/XML or Energy Gauge XML

Metadata
- Job Type (HERS, ENERGY STAR)
- Builder
- Location
- …

PDF assets
- HVAC design report (*optional*)
- Rater design review checklist (*optional*)

3rd Party System

ENERGY STAR® RaterPRO™

Call Back

Success/Error Notification
Rater Pro Job ID

Pull Job

Pull Request

Rater PRO Job ID

Job Pull

XML File: REM/XML or Energy Gauge XML

Metadata

ENERGY STAR Checklist Items (Y/N/NA)

Comment Text

PDF + image locations in S3

3rd Party System

ENERGY STAR® RaterPRO™

Metadata Elements

2-Way (Push + Pull):

- Location (Address, Community + Lot #, and/or custom ID string)
- Job Type (HERS, ENERGY STAR)
- Builder Name
- 3rd Party jobID
- Export Filename

Export-Only (Pull):

- Job Completion (Y/N)
- HVAC and DHW equipment make/model/serial # (optional)
- Static pressure measurements (optional)
- Utility meter numbers (optional)

Metadata Elements

- Additional elements:
  - **Via XML:** Arbitrary elements in REM/XML or Energy Gauge XML would be passed through to final export. I.e. RaterPRO only edits the fields it uses and passes everything else through as-is.
  - **Via Metadata:** We could support additional metadata elements, would just need to know what is needed.

Images and PDFs

2-Way (Push + Pull):

- HVAC Design Report (optional)

- Rater Design Review Checklist (optional)

Export-Only (Pull):

- Images attached to comments

- Elevation photos (front mandatory, others optional)

- HVAC Commissioning Report photo

Job Status List

- Would provide an endpoint for a list job metadata like:

JobID	Location	Builder	Status	Last Modified
162ac6388e213ece4f 6b5537caf400db	123 Oak Lane	Acme Builders	Active (Pre-Drywall)	2/15/18 4:02 PM
bc80011135cf7934e 7feebdf684d68a3	1600 Pennsylvania Ave	Seibert Homes	Completed	1/4/18 12:32 PM
bc80011135cf7934e 7feebdf684d68a3	Avendale Lot 4	Heinrich Brothers	Submitted to Provider	5/19/18 7:12 AM

- Limitation on update frequency (maybe once/hour)

- Can see all jobs in system and associated JobID so you know what is available to pull

- Can track job status, for instance automatically initiating a pull when a job is marked 'Complete'

What is *NOT* supported?
(at least under current plan)

- Editing job 'profile' once it is created (Location, Builder, etc.)

- Editing any detailed jobs elements, like minimum rated feature values or ENERGY STAR checklist values

- Deleting or Archiving jobs

- Submitting a job to a Provider (within RaterPRO's workflow)

- Access to jobs submitted to a *Provider*. I.e. this would only apply to a rating company's jobs.

- Sampling support

Questions for Group

- Are we on the right track with this idea?

- Are there other metadata elements that would be useful?

- Anything on the 'not supported' list we should reconsider?

    – Is there a desire for Provider company support?

    – Would people use sampling support?

- Who is very/somewhat/not interested in using this?

Local Testing API

Uses

- Integrate with performance testing equipment mobile apps (e.g. blower door and ducts)

- Easily initiate a test from RaterPRO and prepopulate basic house info

- Send test results back to RaterPRO where it will be recorded in the final HERS file (via the XML export)

Status

- API Draft document is developed – can share with anyone interested and we welcome feedback

- Development schedule is not finalized, but rough timeline is by end of 2018

- V1.0 would support blower door and duct leakage, potential for additional tests in the future, in particular HVAC grading test

How Will it Work?

- Requires local iPad/Android app. Not cloud-based.

- Applications register with EPA, then become available for selection in user settings

- When initiated by the user, RaterPRO sends a 'request' for a specific type of test along with some home information:

  - Either Blower Door, Duct Leakage to Outside <u>OR</u> Total Duct Leakage

  - Also sends test specific info like target value, area served, house volume

  - Sends ID for callback

- Testing apps send back results along with jobID, callback ID

  - We will accept absolute units only (CFM@25, CFM50)

Questions for Group

- Are we still on track with this idea?

- What is market penetration for wi-fi connected equipment?

- New thoughts or concepts?

  - Better way to integrate with full records kept on 3rd part systems. Pass back a URL to RaterPro?

Open Source

Status

- Currently at early exploratory phase

- At earliest 2-3 years out

- EPA will be in better position to evaluate after a year of public release (2019)

Uses

- Sites and Apps that require more customization

- Drive the future development of RaterPRO by the community, faster than EPA could sustain by itself

- Supports radical different types of rating / inspection types

- Support addition of features that are not directly related to ENERGY STAR's mission

How would it work?

- RaterPRO source code provided on GitHub for others to download and use

- EPA would continue to administer "canonical" version of RaterPRO

- 3rd Parties could "fork" the code and create customized solutions

- 3rd Parties could make "pull" request asking us to pull their feature into our main code base. EPA would, at minimum, retain veto power.

- 3rd Parties could host their own "closed" version of the app using our infrastructure as code (our AWS Cloud Formation templates)

Developer Prerequisites

AWS

- Knowledge of Docker, Elastic Container Services, AWS S3, AWS Cognito, AWS Network architecture
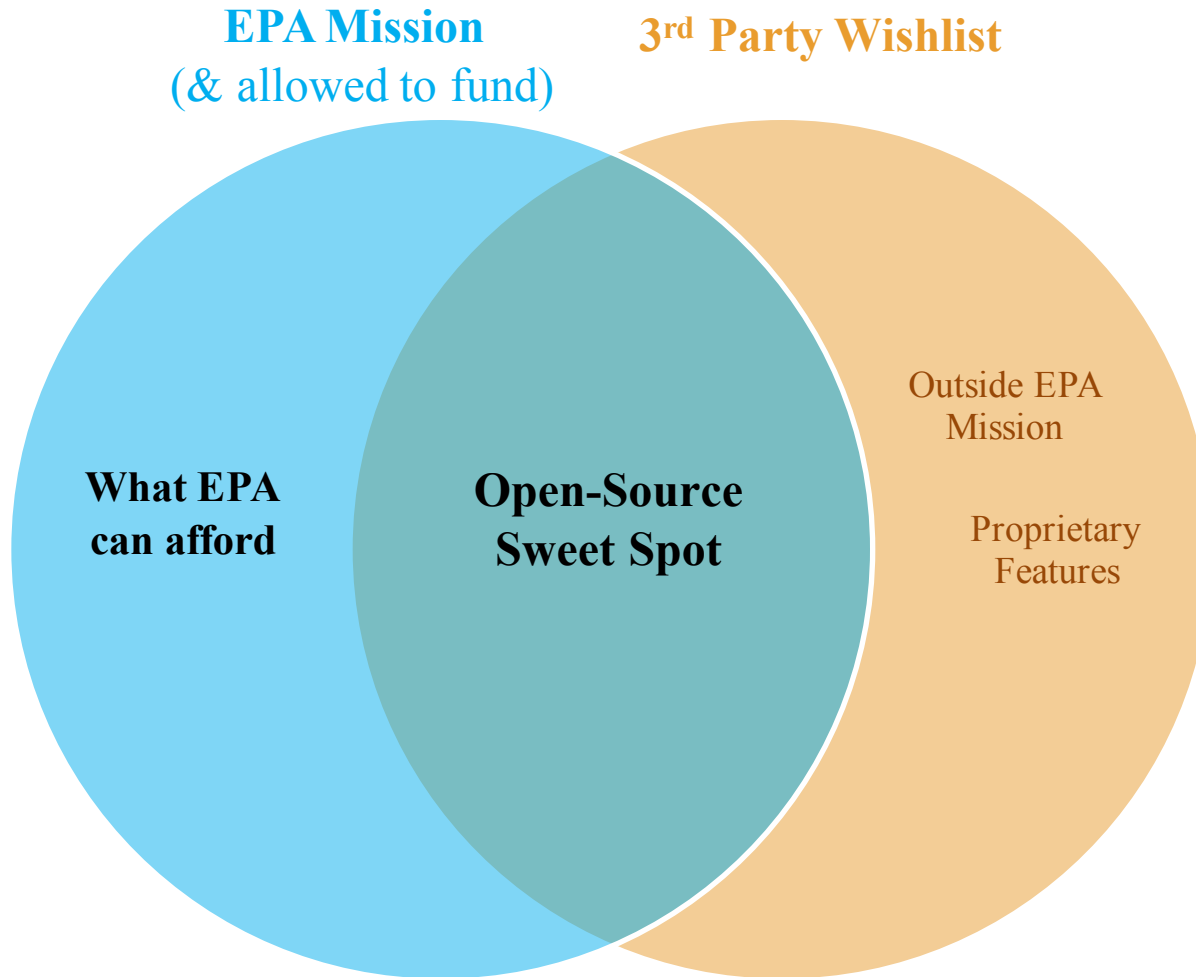
Programming Skills

- UI: JavaScript, specifically AngularJS framework

- App: PhoneGap

- Backend: JavaScript, specifically NodeJS

Data

- CouchDB

Challenges

EPA Mission
(& allowed to fund)

3rd Party Wishlist

What EPA
can afford

Open-Source
Sweet Spot

Outside EPA
Mission

Proprietary
Features

Challenges

- It may not be possible to host any proprietary features in the EPA-hosted "canonical" version.

- Proprietary features may require an independently hosted "forked" version. Potential for forks to diverge over time.

- There is a cost in vetting and testing code in a pull request. May need to charge a fee, at least for features tangential to EPA's mission.

Questions

- Who has theoretical interest in participating in an Open-Source project?

- Is there a core interest in giving back to the "canonical" code base? Or is main desire for adding proprietary features to a forked version?

- What types of features would be possible through an Open-Source project that couldn't be accomplished via an API?

ENERGY STAR Certified Homes

Web & Email:

Main: www.energystar.gov/newhomespartners
Technical: www.energystar.gov/newhomesguidelines
Training: www.energystar.gov/newhomestraining
HVAC: www.energystar.gov/newhomesHVAC
Email: energystarhomes@energystar.gov

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