

QA Automation Framework - Vision

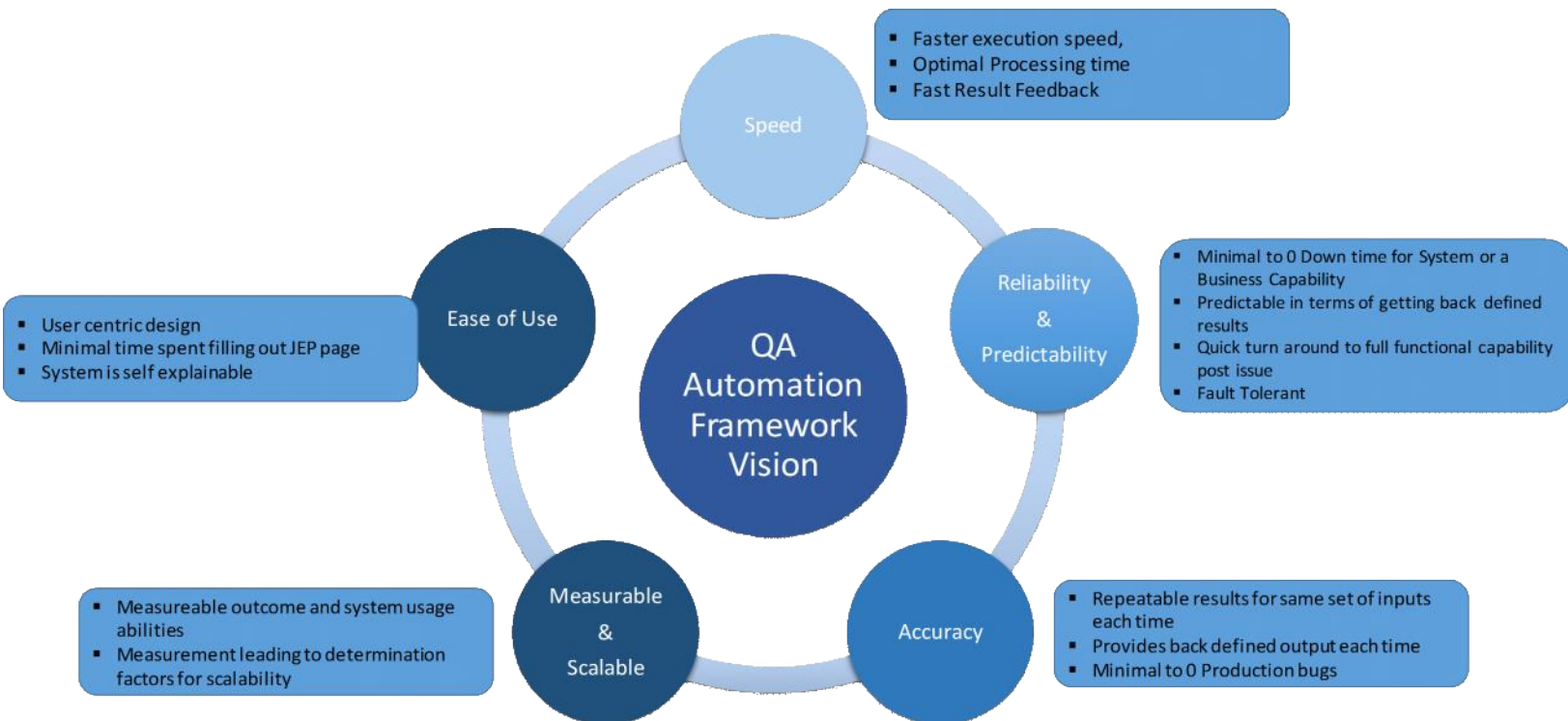
Wednesday, July 05, 2017 3:42 PM

Below is the QA Automation Framework Team Vision.

Value statement:

- Speed
- Reliability and Predictability
- Accuracy
- Measurable & Scalable
- Ease of Use

These "Value Statements" will serve to use Value Stream defining the outcome of our work towards these Statements which ultimately alleviate our Customers challenges that we are entrusted to solve.



QA Automation Key Initiatives

Thursday, July 06, 2017 2:49 PM

S.no	Theme	Description	Progress	ETA	Benefits
1	Shift Automation Left	CI and D. This will enable engineers to QA Automation Test cases post commit made to CI tool	<ul style="list-style-type: none"> • POC – Complete • Implementation for 1 Application in Testing 	This Implementation will Follow Engineering teams adaption of Dev Services CI template adaption	<ul style="list-style-type: none"> • Increased Automation leverage • Early Bug Detection • Speed to market
2	Shift Automation Left	Provide Engineers with ability to run QA Automation Test cases Locally on their laptops	<ul style="list-style-type: none"> • POC – Completed • Protractor – Completed • Selenium – Yet to Start 	<ul style="list-style-type: none"> • Protractor – Completed • Selenium – July 2017 	
3	Shift Automation Left	QA Automation Scripts to move to GIT repository from Perforce	<ul style="list-style-type: none"> • POC – Completed • Protractor – Implementation Started in Analytics, Core and Platform • Selenium – POC in progress 	<ul style="list-style-type: none"> • Framework Support – July 2017 • Protractor – Sept 2017 • Selenium – Nov 2017 	<ul style="list-style-type: none"> • QA Automation Scripts close to Engineering application Code based • Increase QA Automation Test leverage
5	Testing Infrastructure Scale	Cross Browser Testing Vendor implementation	<ul style="list-style-type: none"> • Vendor Evaluation – In progress • POC- Yet to start • Implementation with current Automation framework - Yet to start 	<ul style="list-style-type: none"> • POC – Aug 2017 • Implementation - Sept 2017 <i>(Tentative as it depends on Security and legal processes)</i> 	<ul style="list-style-type: none"> • Cost savings for internal investment which is higher than vendor • Cross browser testing and Mobile testing increased footprint • Test Automation Scale
4	Evolution of new Skillset in QA	Web Service Testing adaption	<ul style="list-style-type: none"> • POC – Completed • Framework Implementation – Completed • Adaption in Core, Platform and IS – In Progress • Adaption in Analytics – Yet to Start 	<ul style="list-style-type: none"> • 100 test cases – July 2017 • 300 test cases – Dec 2017 	<ul style="list-style-type: none"> • Testing Pyramid Achievement • Improved scripting efficiency to 1.5 day for a script from 1 week
6	Evolution of new Skillset in QA	ETL Testing	<ul style="list-style-type: none"> • Define Test Strategy – Yet to start • Identify and Acquire Testing tool • Identify resources • Establish Practice 		
7	Tellus 2.0	Re-write of Job Scheduler using Apache Chronos		Oct 2017	
8	Tellus 2.0	Re-write and Standardization of Tellus UI		Dec 2017	
9	Tellus 2.0	Adaption of CI tool Jenkins	<ul style="list-style-type: none"> • Design and intial set up discussion started as of 07/13 • POC planned - Finish by Jul 28th 	Sept 2017	Accurate Application Code deployment High Quality Application experience for user Low production bugs
10		CDN Testing framework	<ul style="list-style-type: none"> • POC – API testing • POC – UI Testing • Identify Infrastructure needs • Acquire Infrastructure • Implement Framework 		
11		Improve Scripting Efficiency			



QA
Automati...

Data for apps for Core

No# of bug and manually and automated and client
 Risk or importance
 Geo rev important contnt set 7000
 Risk is low

Tellus Production Support Model

Monday, August 07, 2017 2:02 PM

Level 1 - Triage group -
Daily RPDs triage

RPD Metrics

Tuesday, August 08, 2017 8:06 AM

RPD Views (Not RPD Metrics, that is below this)

Month of July 2017 App QA Automation RPDs Opened and UnResolved - RPD Views as of 8 Aug 2017

Number of App QA Automation RPD's **OPENED (135)** in July 2017 <http://is.factset.com/rpd/default.aspx?viewid=31515224>

Number of App QA Automation RPD's **UnRESOLVED (84)** in July 2017 <http://is.factset.com/rpd/default.aspx?viewid=31515593>

FY2017 as of 8 Aug 2017

Number of App QA Automation RPD's **OPENED (1284)** in FY2017 <http://is.factset.com/rpd/default.aspx?viewid=31515597>

Number of App QA Automation RPD's **UnRESOLVED (478)** in FY2017 <http://is.factset.com/rpd/default.aspx?viewid=29917006>

RPD Metrics

Chrome Link for Ken's RPD Metrics


<http://is.factset.com/rpd/Default.aspx?tab=4>

Screen shot of RPD Metrics VIEWS



As of 8/18/2017

New

reated :

  AppQAAutoDailyLastWeek

  AppQAMetricWeeklyFY2017

  AppQAAutoMonthlyfy2017

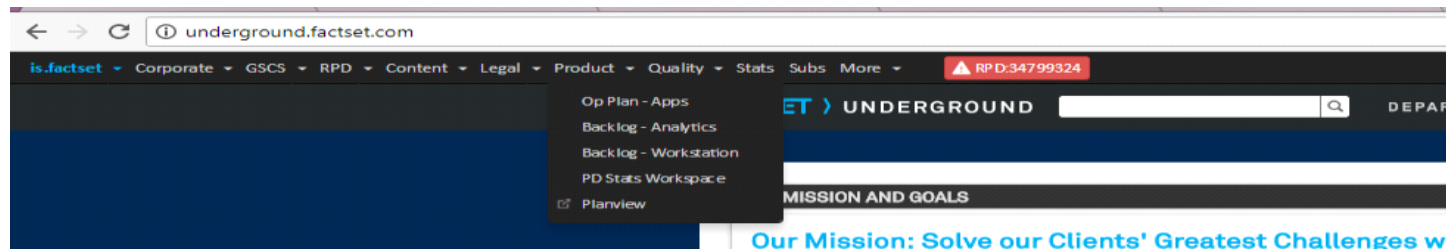
hared :

 testing2

How to fill in PPM timesheets?

Monday, October 02, 2017 1:30 PM

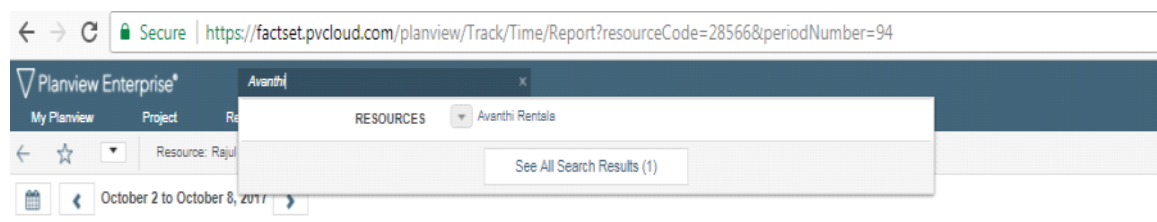
Step 1 Go to Product Tab in Underground



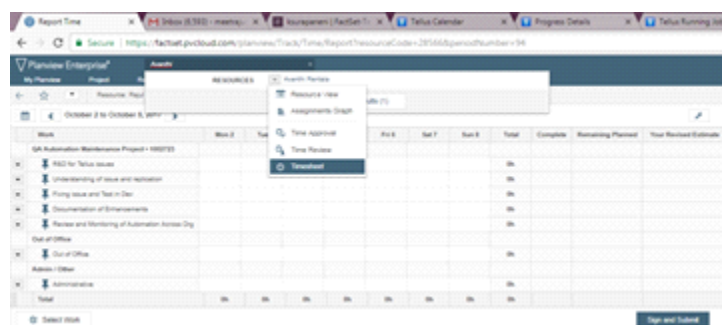
Or Use direct UL <https://factset.pvcloud.com/planview/>

You should be able to log in as it works with SSO

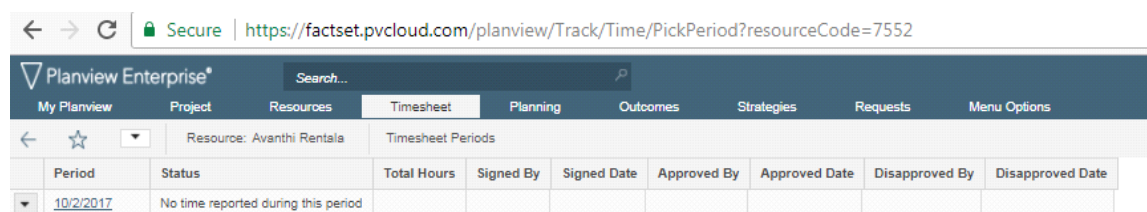
Step 2 Search for yourself in the search bar



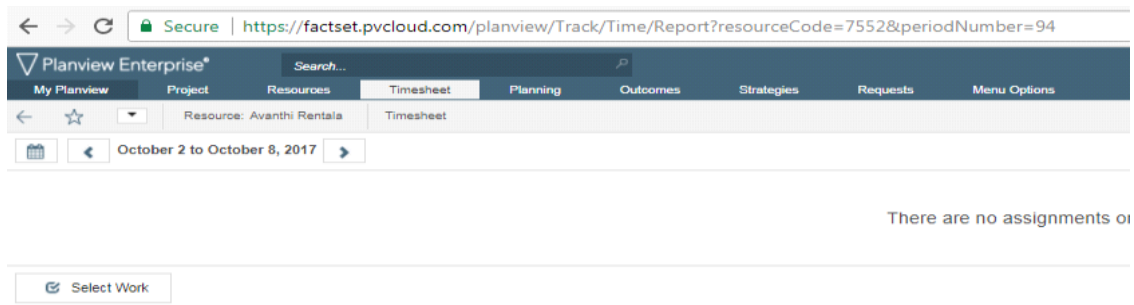
Step 3 Click on the Down arrow next to resources with your name to display menu of option and click on Timesheet



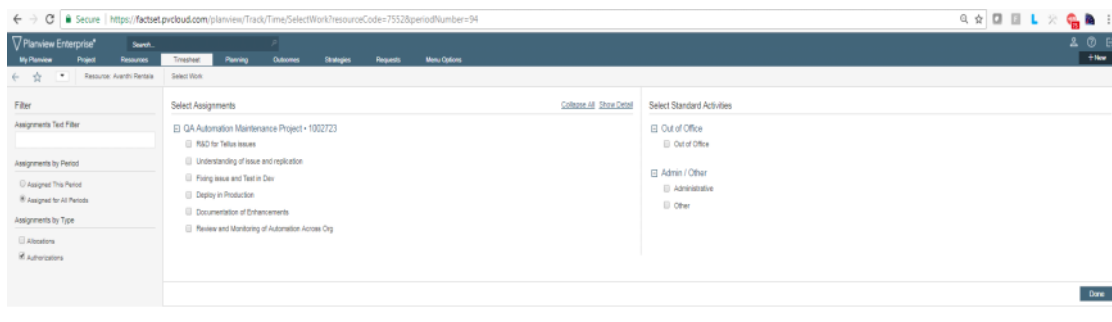
Step 4 When on click on timesheet you should see below view.



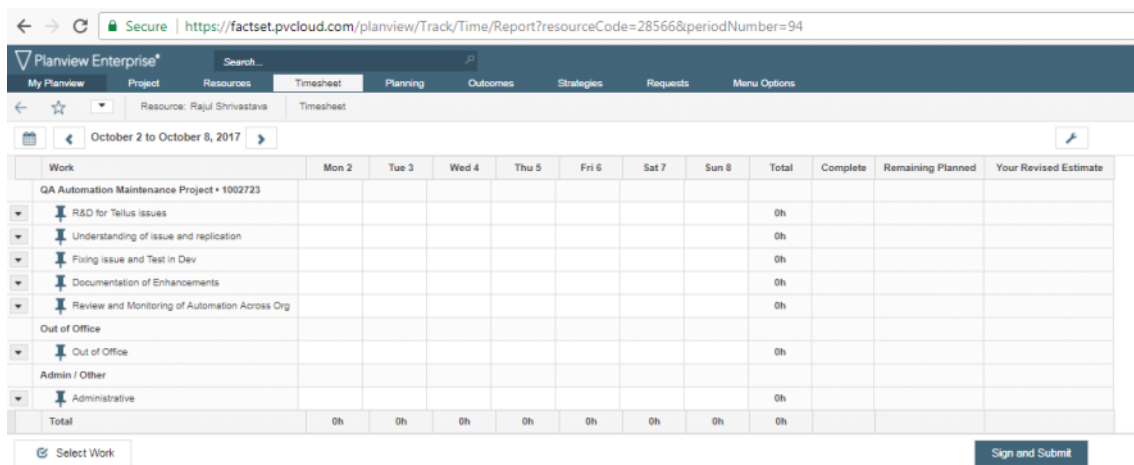
Step 5 when you click on link with Period Date 10/2/2017 below view will appear



Step 6 when you click on Select Work on screen shown in Step 5 you should see following tasks listed.



Step 7 when you select your task listed on step 6 and click done you should below.
 Make sure you PIN them so that you do not have to select the task again (Step 6)
 Please fill timesheet with hours filled **totaling = 40 hours** and **sign and submit**.
 Please ensure you fill this up starting 9/1. You can navigate back using the arrow next to calendar icon.



Team Contact Information

Wednesday, December 13, 2017 4:03 PM

Name	Cell Phone	Office num	
Joseph Hwang	203-253-2473	203-810-2204	
Lilun Cao	203-824-8488		
Avanthi	91 8985895188	91 7702220591	
Krishna Teja	91 9533355933	91 8522088722	
Surya	+91 9133122589		
Murali	+919866724158		
Sriteja	+91 7416333164		
Rajul	8603086985		Just in case

Per

Tellus Status Jan 2018

Friday, January 12, 2018 11:10 AM

Lilun's Project Ownership

1. [Tellus Scheduler \(RestfulSchedulingService\)](#) -- Java EE
 - a) Java EE - Joseph (Most knowledgeable), Murali (and maybe Avanthi)
 - b) Most critical piece. No code change for a long time. Fairly stable.
 - c) It sometimes needs a restart - everyone should be able to handle that when necessary.
 - d) No immediate RPDs requiring attention.
 - e) RPD Product - App QA Automation (Sub category Scheduler)
2. [Tellus API](#) -- PHP, Java EE
 - a) Primarily PHP. Only Java EE for validation. Most folks on QA automation backend should be able to handle PHP.
 - b) QAI calls into it. Considered mission critical. Other Tellus components calls into it. BVT called in as part of builds, used in production.
 - c) No immediate RPDs requiring attention.
3. Tellus front-end (Web/JavaScript, PHP): Specifically Job List page -- this is covered by everyone else, too
 - a) No immediate RPDs requiring attention.
 - b) Various low severity RPDs but no consumers waiting.
4. Selenium Grid: <http://infonyet/view/QualityAssurance/SeleniumGridDirectory>
 - a) Sriteja participated in maintenance.
 - b) **Test Not Run Issue - Reassigned to Joseph** - <http://is.factset.com/rpd/summary.aspx?messageId=37792879>
5. [RPD:36870484](#) BrowserStack POC
 - a) Primarily led by Lilun.
 - b) We're going to allow engineering to proceed with their PoC starting on 1/31/2018.
 - c) Look into jointly owning between Joseph and incoming engineer on Monday 2/5.

Joseph Priorities Going forward

- **10% - Tech support / Overseeing architectural decisions/questions/etc...**
- **45% - BrowerStack PoC**
- **45% - Tellus Performance (Database)**

Immediate Assignments for Joseph

- Speak w/ Kun about Lima needs for staging testing. -- **Done**
 - => Kun confirmed dropping iOS LIMA staging from PoC
 - Investigate/log any other BrowserStack areas we'll need to investigate for PoC. Plan to regroup on Monday w/ engineer and start planning attack.
- Begin investigating Tellus database performance issue.

Joseph Day to day Priorities

- BrowserStack - How to run, proxy for local, how to connect to proxy server, etc...
 - Tested out BrowserMob for Lima use. (Kun mentioned Lima needs for mobile testing)
 - May only need Lima here for staging testing. Production release hits public URLs.
 - **We'll need to follow up with Kun and confirm requirements for staging testing.**
 - Test script for BrowserStack
 - QA Test US - Used for CID project testing.
 - Troubleshoot test script with Lilun. Now running fine. Error was related to screen resolution.

- Melissa Oconnor (Universal Screening) - Noticed in one test, first code change has build, overrides didn't work but tests passed when they should fail.
 - Second run - No code change - Started failing correctly.
 - Serial # API did not set the overrides properly. They opened up an RPD 37859211 <http://is.factset.com/rpd/summary.aspx?messageId=37859211>
 - ◆ Looking for a fix from Murali.
 - **This has been delegated to Murali. Joseph will verify that it works after the fix.**
- CID Protractor
 - Finished recently (few weeks ago).
 - Following that Melissa had additional questions (not CID, but be able to specify the test to run)
 - Scripting issue. Likely falling onto Bhupender's plate.
 - [RPD:37645150](#) CID Pipeline QA protractor testing: Config Scripts to Run
 - CID pipeline script will need to be modified to call tests appropriately after Bhupender fix.
 - **Joseph is around to help troubleshoot after changes in case of issues.**
- CID Ruby Selenium
 - Equivalent to CID Protractor above but for Ruby.
 - Waiting on test script fixes. Test scripts getting failures/errors. Scripting team is handling (Bhupender).
 - **Joseph is around to help troubleshoot after changes in case of issues.**
- Tellus Scaling
 - Working on Part 3 - Load Balancing. (Conventional load balancer versus Kubernetes).
 - Kubernetes is a better long term solution as it takes CPU/Memory into account where conventional load balancers do not.
 - **In a similar test...**
 - CPU utilization of PHP is not very high.
 - We were load balancing initially due to CPU utilization... but instead the time is waiting on database, not CPU intensive.
 - Database has several tables joined together. When it gets larger, the architecture here is likely causing slowdown. **Next step would be looking into database performance tracking/scaling. (Database is in SQL Server)**
 - **Waiting on infrastructure engineering in FQ3FY18.**
 - **Joseph was going to look into a conventional solution in the interim.**
- **STAF (Dispatcher)**
 - Joseph listed a few issues. Primarily being handled by Avanthi and Krishnateja.

Bhupender - Primarily test scripting. BrowserStack from the beginning. Not involved with Tellus.

Tellus - Joseph, Avanthi Krishnateja, etc...

- There are default assignees for specific categories. Tellus API automatically assigned to Lilun. STAF -> Avanthi.

Redirect App Qa Automation Auto Assignees

- API
- Selenium Grid
- Tellus Job List Page

Stability Issues

1. [RPD:30045825](#) Tellus FocalPoint error: ran out of VMs
 - a) **Causes:**
 - i. This is primarily Tellus Scheduler design issue of "depending on estimated durations"
 - 1) **Solution:** [QAF-465](#)/[RPD:34796867](#) / [RPD:30237198](#) Tellus switch to Kubernetes or Apache Chronos -- Joseph

- ii. **STAF** tier did not free VM on STAF exception -- currently STAF job scripts (so called "dispatchers") are written as mixture of XML and embedded Python, but it cannot catch exceptions across XML
 - 1) **Solution:** [RPD:25471809](#) Tellus STAF dispatcher catch all exceptions -- Krishnateja
 - a) Write STAF job script completely in Python so as to catch all exceptions, except entry point XML. The current difficulty is large amount of code to convert.

Note: a) When we migrate to Kubernetes or Apache Chronos job scheduler, Selenium Grid job scripts would be deprecated/replaced, but FocalPoint jobs might still need this for now. b) *If* and this is a big "if", we adopt to Docker for Windows with Kubernetes/Mesos, FocalPoint job scripts could also be deprecated/replaced. (Docker for Windows is still not released yet.)
 - iii. Hung jobs -- this is a big topic in itself (see #6 "Hung jobs" below)
- 2. ~~NPM install takes several minutes (> 7) and high CPU and memory utilization -- Krishnateja~~
 - a) **Solutions:**
 - i. **[Completed]** [RPD:34728138](#) Use yarn to download node_modules on Tellus
 - ii. **[Completed]** [QAF-524](#) download test suite directly to tellusb04 for SGE jobs
- 3. Sometimes Tellus server has high CPU, memory
 - a) **Causes:**
 - i. ~~npm has high CPU -- this is a topic in itself -- see topic #2 "NPM" above~~
 - ii. ~~STAF tier (Chron, STAX) using CPU and memory~~
 - 1) **[Completed] Solution:** [QAF-523](#) download test suite directly to VM for FPE jobs -- Krishnateja
 - iii. Higher job volume in recent times (see "Need for scaling" topic below)
- 4. Need for scaling -- higher job volume in recent times, putting pressure on server capacity
 - a) **Long Term Solution:** Load balancing with Kubernetes or Apache Mesos -- distributed CPU, memory resource sharing, application load balancing. Depends on "[Tellus Switch to Kubernetes or Apache Chronos job scheduler](#)" above.
 - b) **Short-term Solution:** [RPD:36380734](#) Master Tellus Application Scale
 - i. Phase 1 and 2 have been completed: new server tellusb03 with higher capacity, and split Selenium Grid load to tellusb04 -- Avanthi, Krishnateja
 - ii. Phase 3 conventional load balancer (such as HAProxy, GoBetween) -- Joseph
 - 1) ETA: End of Feb 2018
- 5. [RPD:34666075](#) Tellus FocalPoint VM timeout (while allocating VM) -- Avanthi
 - a) **Cause:** It happens sometimes; occurrence frequency varies greatly. Sometimes it happens when there are only about 20 VMs, so we are not convinced that it is load related. Could it be FocalPoint issue? Race condition? Or simply wrong status (ip.txt)? Avanthi will investigate when she has more time.
- 6. Hung jobs -- Avanthi
 - a) **Causes:**
 - i. Scripting issue, e.g. unexpected dialog prompt
 - 1) **Possible Solution:** Probably should timeout waiting for elements
 - ii. STAF "dispatcher" (job script) exception -- does not gracefully terminate job, release VM, or set job termination status, due to exception(?)
 - b) **Current solution:** We have utility to kill jobs that run longer than 8 hours
 - c) **But Possible Improvement:** Currently arbitrarily kills job after 8 hours, but we probably should distinguish between normal long jobs and hung jobs (and not kill normal jobs) -- Avanthi
 - i. [RPD:31133602](#) / [RPD:31278118](#) Tellus hung job detection utility -- Avanthi
- 7. [RPD:31219100](#) Tellus jobs running much longer than before (e.g. BVT ran for days) -- Avanthi
 - a) To check if they are normal or "hung"
 - b) Avanthi will investigate this when she has time

8. Many job failures (see [Calendar](#))
 - a) About 1/3 of jobs are "yellow" (not run) -- primarily STAF tier issue -- Avanthi, et. al.
 - b) Another 1/3 are "red" (failed) or "pink" (partially failed) -- scripting issue (not Tellus issue, but major user complaint)

Major Projects for Solutions to Stability Issues

We can generally categorize the stability *solutions* into these major projects:

1. New Job Scheduler -- Kubernetes or Apache Chronos [RPD:34796867](#) -- Joseph
 - a) We need this ASAP, but pending Infrastructure Team work -- currently Q3. Contact: Kyong Kim for infrastructure
 - b) Note: It replaces Tellus Scheduler, "JobQueue", and STAF Cron
2. Job load balancing:
 - a) **[Completed]** Split jobs to another server -- for short term [QAF-523](#) -- Krishnateja
 - b) Kubernetes or Apache Mesos+Chronos -- for long term [RPD:34796867](#) -- Joseph
3. Tellus application load balancing (i.e. scaling Tellus application itself) -- Joseph
 - a) Conventional load balancer -- for short term [RPD:36380734](#)
 - i. ETA: End of Feb 2018
 - b) Load balancing with Kubernetes/Mesos -- for long term [RPD:34796867](#)
Note: Conventional load balancer generally does not take CPU and memory utilization into account, but Kubernetes and Mesos load balancers do.
4. STAF tier fixes: -- Avanthi, Krishnateja
 - a) Handle Hung jobs [RPD:31133602](#)/[RPD:31219100](#)
 - b) Catch all exceptions and gracefully clean up (free VM, etc.) [RPD:25471809](#)
 - c) Many "job not run" issue, primarily due to various STAF tier exceptions
5. FocalPoint: VM allocation timeout [RPD:34666075](#) -- Avanthi
6. Many test script failures -- This is not Tellus issue, but major user complaint

Other Major Projects

- [RPD:36870484](#) Preparation for BrowserStack POC - Action items for Tellus Framework and Scripting team -- Lilun
- **[Completed]** [RPD:28933380](#) POC: CID Pipeline QA *protractor* testing -- Joseph
- [QAF-555](#)/[RPD:29089948](#) POC: CID Pipeline *Ruby* Selenium testing -- Joseph
 - Pending scripting issues - in scripting team's court -- Bhupender
- Tellus support for WebSocket testing: [QAF-526](#), [QAF-514](#) -- Murali, Sriteja
- [RPD:34202497](#) Tellus 2.0 master RPD (lower priority) -- all

Task Assignments

Current Tasks are in Jira:

<https://factset.atlassian.net/secure/RapidBoard.jspa?rapidView=204&projectKey=QAF>

Project Documents

- [Tellus 2.0 Project](#)
- [BrowserStack POC/MobileTestWithBrowserStack](#)

Tellus Infrastructure

Tellus Production: tellusb03 (tellusb01 has been deprecated as production server)

Tellus DEV: tellusdevb01

SQL Server Production: tellus-sql-primary.prod.factset.com

SQL Server Failover: tellus-sql-failover

SQL Server DEV: tellus-dev-sql.prod.factset.com

Selenium Grid Machines: <http://infonet/view/QualityAssurance/SeleniumGridDirectory>

(That includes iOS testing with Appium through Selenium Grid.)

Tellus Architecture

The current Tellus Architecture is similar to the following diagram, but it is currently not load balanced:

[Figure 1. Tellus Load Balancing Architecture With STAF Cron](#)

Major Components:

- Web browser tier (JavaScript) -- Main UI: [Tellus](#)
- Web server tier (PHP)
- STAF (Cron) tier - [tellus-backend](#)
- BVT: Python (Apache, WSGI) -- called by product build process
- Tellus API (called by QAI, other Tellus components) -- mixture of PHP and Java
- Tellus Priority-based Scheduler ([RestfulSchedulingService](#)) => soon to be deprecated by Kubernetes or Apache Chronos
- Tellus "[jobqueue](#)" (companion to Tellus Scheduler) => soon to be deprecated by Kubernetes or Apache Chronos

Source Code Repositories

- Tellus front-end source code: [tellus](#)
- [tellus-backend](#)
- Tellus API: [api](#)
- Tellus Priority-based Scheduler ([RestfulSchedulingService](#)) => soon to be deprecated
- Tellus "[jobqueue](#)" => soon to be deprecated
- [SITQAPLugin](#) (deprecated)
- [fullcalendar](#) (UI control) -- used by Tellus Calendar
- [chronos2x](#) (Chronos scheduler POC)
- CID Pipeline script: [qa-cid-test](#)

Tellus GIT repos

Thursday, February 08, 2018 10:31 AM

Tellus projects:

[tellus](#) (frontend)

[tellus-backend](#)

[api](#) ("Tellus API")

[RestfulSchedulingService](#) (Tellus Scheduler)

[tellus-ci-api](#) ("Serial Number API")