# SYSTEM TO AGGREGATE AND SUMMARIZE PD METRICS FOR A SET OF RELATED RUNS

# Project Incentives



## Qualitative Analysis

- No capabilities for quick qualitative analysis i.e. pass/fail

## Input of Metrics

- Metrics are manually put into working spreadsheets
- Figure 1 shows page 1 of 81 of manually inputted metrics

## Overwhelming Metrics Stats

- A CI run can output hundreds of metrics for all the steps completed
- Figure 2 shows an automated metrics database
  - Although it may work for a specific project, it is not as configurable or concise

zme2 ep46 p2 RITA1

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WorkTree: | /afs/apd/func/visi/eclipz/sf5/da/ec/integ/zmed2/volumes/vol05/jemoser_core_dd2_ifb_jup1082510_sgt_call_3/pd/ec | | | | | | | | |
| Comments | Super ECO mode<br>Run for ECO's requiring new cut | | | | | | | | |
| Latch ECO? | Yes | | | | | | | | |
| knob: | flow.super_eco.icIless.exp0 | | | | | | | | |
| Jenkins Stats | TaggingNumNets | 174178 | | | | | | | |
| | TaggingNumFails | 9825 | | | | | | | |
| | TaggingNumNC | 6 | | | | | | | |
| | TaggingFOM | -201402.297737121 | | | | | | | |
| | TaggingSlackM200ps | 215 | | | | | | | |
| | TaggingSlackM100ps | 49 | | | | | | | |
| | TaggingSlackM50ps | 161 | | | | | | | |
| | TaggingSlackM20ps | 1329 | | | | | | | |
| | TaggingSlackM10ps | 2581 | | | | | | | |
| | TaggingSlackM0ps | 5490 | | | | | | | |
| | Tagging G30 | 0 nets, length | min 500000, max 0, avg 0 +/- 0 | | | | | | |
| | Tagging G20 | 6706 nets, length | min 0.0, max 5213.924, avg 681.2550396659689 +/- 0 | | | | | | |
| | Tagging G15 | 72 nets, length | min 118.56299999999999, max 951.114, avg 471.2612500000001 +/- 0 | | | | | | |
| | Tagging G10 | 8 nets, length | min 702.229, max 887.826, avg 783.3634999999999 +/- 0 | | | | | | |
| | Tagging B20 | 0 nets, length | min 500000, max 0, avg 0 +/- 0 | | | | | | |
| | Tagging B15 | 22923 nets, length | min 0.0, max 3863.052, avg 522.3325992344021 +/- 0 | | | | | | |
| | Tagging B10 | 0 nets, length | min 500000, max 0, avg 0 +/- 0 | | | | | | |
| | Tagging H30 | 0 nets, length | min 500000, max 0, avg 0 +/- 0 | | | | | | |
| | Tagging H20 | 29356 nets, length | min 0.0, max 5258.001, avg 549.3431861203846 +/- 0 | | | | | | |
| | Tagging H15 | 0 nets, length | min 500000, max 0, avg 0 +/- 0 | | | | | | |
| | Tagging H10 | 0 nets, length | min 500000, max 0, avg 0 +/- 0 | | | | | | |
| | Tagging D20 | 165522 nets, length | min 0.0, max 69788.4975, avg 193.98290938969643 +/- 0 | | | | | | |
| | Tagging D10 | 0 nets, length | min 500000, max 0, avg 0 +/- 0 | | | | | | |
| | Tagging M30 | 65683 nets, length | min 0.0, max 27984.907, avg 76.78892402144051 +/- 0 | | | | | | |
| | Tagging Other | 0 nets, length | min 500000, max 0, avg 0 +/- 0 | | | | | | |
| | TagPercentage G30 | 0 | | | | | | | |

*Figure 1: Joseph Moser, zMeCore MSC Results.xlsx, page 1*

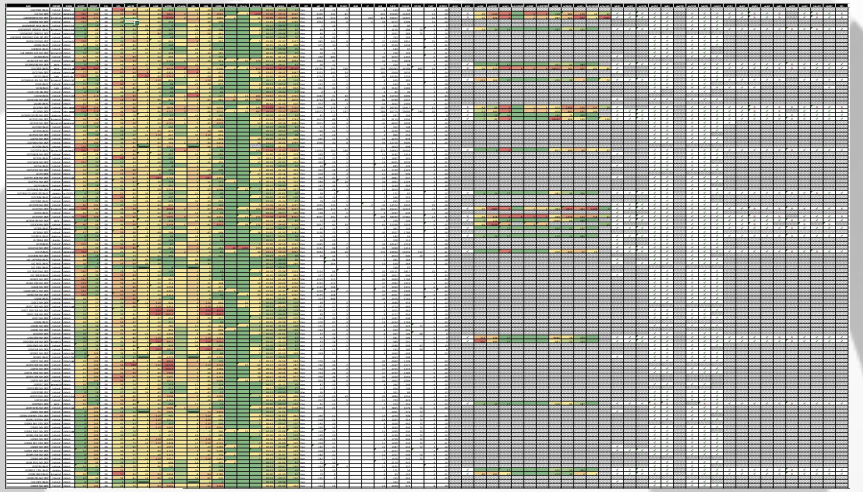

*Figure 2: Nazim Aziz, _.dayto_day.xlsx from statsio*

# Discussion with Potential Users




Joseph Moser – Core Integration Lead


Bradley Sears – Physical Design and Integration


Andrew Bianchi – Core Physical Design Lead


Mary Jo Saccamango – Circuit Design


Lara Acevedo – Physical Design


Genevieve Shafer – Physical Design


Limor Plotkin – Core Timing Lead


Sayaan Nawaz – Physical Design


Alex Shnayder – Circuit Team Leader


Rina Kipnis PD Lead LSU


Vadim Liberchuk – PD Lead ISU

# Overall Output



- Displays various metrics from PD runs
- Automate CI metrics into a personalized summary
- Slack integration of CI run feedback
- Easily interpretable visuals for relative success of a run

| | user_id | l2l_fom | bonn_wace4_ALL | l2l_worst_slack | step | mark |
|---|---|---|---|---|---|---|
| LS_DERT_MAC | chamilt | -402 | 91 | -10 | 799_PDS_Exit_Socket | success |
| LS_EADA_MAC | chamilt | -850 | 95 | -11 | 799_PDS_Exit_Socket | success |
| LS_EADV_TOP_MAC | chamilt | -92 | 104 | 4 | 799_PDS_Exit_Socket | success |
| LS_EXEL_TOP_MAC | chamilt | 0 | 96 | 10 | 799_PDS_Exit_Socket | success |
| LS_MIDL_MAC | chamilt | -1736 | 100 | -13 | 799_PDS_Exit_Socket | success |
| LS_SDQD_TOP_MAC | chamilt | -413 | 105 | 3 | 799_PDS_Exit_Socket | success |
| LS_SOUTH_MAC | chamilt | -3539 | 91 | -30 | 799_PDS_Exit_Socket | success |
| LS_SRQHM_MAC | chamilt | -25 | 103 | -4 | 799_PDS_Exit_Socket | success |
| LS_SRQZL_MAC | chamilt | -206 | 96 | 2 | 799_PDS_Exit_Socket | success |
| LS_SRQZR_MAC | chamilt | -187 | 103 | 2 | 799_PDS_Exit_Socket | success |
| EL_LSU | chamilt | | | | 2001_Final_Stats_Promote | success |
| SD_DISPATCH_MAC | junchen | -12615 | 89 | -36 | 799_PDS_Exit_Socket | success |
| SD_ISQ_MAC | junchen | 0 | 93 | 2 | 799_PDS_Exit_Socket | success |
| SD_ISQ_REQ_CNTL_MAC | junchen | -41807 | 91 | -44 | 799_PDS_Exit_Socket | success |
| LS_RADA_MAC | chamilt | -2663 | 99 | -17 | 799_PDS_Exit_Socket | success |
| LS_LRQFL_MAC | chamilt | -2190 | 110 | -12 | 799_PDS_Exit_Socket | success |
| LS_PRQ_LBS_MAC | chamilt | -136 | 95 | 2 | 799_PDS_Exit_Socket | success |

*Figure 3: Alec Bender, output_data.xlsx*

| Macro_name | L2L_fom | Util | L2L | Wace4 | Verity |
|---|---|---|---|---|---|
| LS_DERT_MAC | -402.214 | 46 | -9.788 | 90.88 | True |
| LS_EADA_MAC | -850.052 | 26 | -10.837 | 94.86 | True |
| LS_EADV_TOP_MAC | -92.4561 | 39 | 4.45723 | 103.68 | True |
| LS_EXEL_TOP_MAC | 0 | 56 | 10.002 | 95.85 | True |
| LS_MIDL_MAC | -1736.37 | 42 | -13.4127 | 100.13 | True |
| LS_SDQD_TOP_MAC | -413.09 | 45 | 2.938 | 105.29 | True |
| LS_SOUTH_MAC | -3539.22 | 25 | -29.901 | 90.62 | True |
| LS_SRQHM_MAC | -24.8863 | 43 | -4.05276 | 102.88 | True |
| LS_SRQZL_MAC | -205.538 | 55 | 2 | 95.67 | True |
| LS_SRQZR_MAC | -186.57 | 56 | 1.99902 | 102.83 | True |
| EL_LSU | 333 | 333 | 333 | 333 | 333 |
| SD_DISPATCH_MAC | -12614.7 | 43 | -35.688 | 88.65 | True |
| SD_ISQ_MAC | 0 | 61 | 2.026 | 92.74 | True |
| SD_ISQ_REQ_CNTL_MAC | -41807.2 | 53 | -43.683 | 91.23 | True |
| LS_RADA_MAC | -2663.26 | 37 | -17.326 | 98.53 | True |
| LS_LRQFL_MAC | -2190.5 | 57 | -12.396 | 110.48 | True |
| LS_PRQ_LBS_MAC | -135.792 | 58 | 2 | 95.25 | True |

*Figure 4: Farhiya Osman, Slack Direct Message*

# Structure of User Interface



**Frontend (yaml)**

- Takes in desired metrics and their subsequent thresholds

**Backend (MongoDB)**

- Collect metrics from MongoDB
- Convert into a Pandas dataframe
- Indicates relative success based on given thresholds

```yaml
macro_data:
  #####Routing Status######
    # True include both pre/post routing (rptMAR)####
    # False just pre-routing (rptPDS) ###
  ##Warning Threshold###
  database_inputs:
    ctechipid: "psdd1"
    database: "spiel"
    collection_name: "rlmdata_test"
    git_sha: '60f5b5eface7c895a3c18dabcd705f65baacbef0'
    output_data_name: "output_data"
  setup_parm:
    warning_threshold: True  # Add comments #
    routing_status: True
  metric:
    l2l_fom:
      success_thresh: 0
      fail_thresh: -50
    l2l_worst_slack:
      success_thresh: 0
      fail_thresh: -20
    rr_wace4_ALL:
      success_thresh: 93
      fail_thresh: 70
    bonn_wace4_ALL:
      success_thresh: 93
      fail_thresh: 70
    #Verity###
    #false: don't include verity data;
    #true: include verity data 0 means we want verity data
  verity:
    status: False
```

*Figure 5: Alec Bender, Farhiya Osman, output, config.yaml*

# Macro Scale of Project



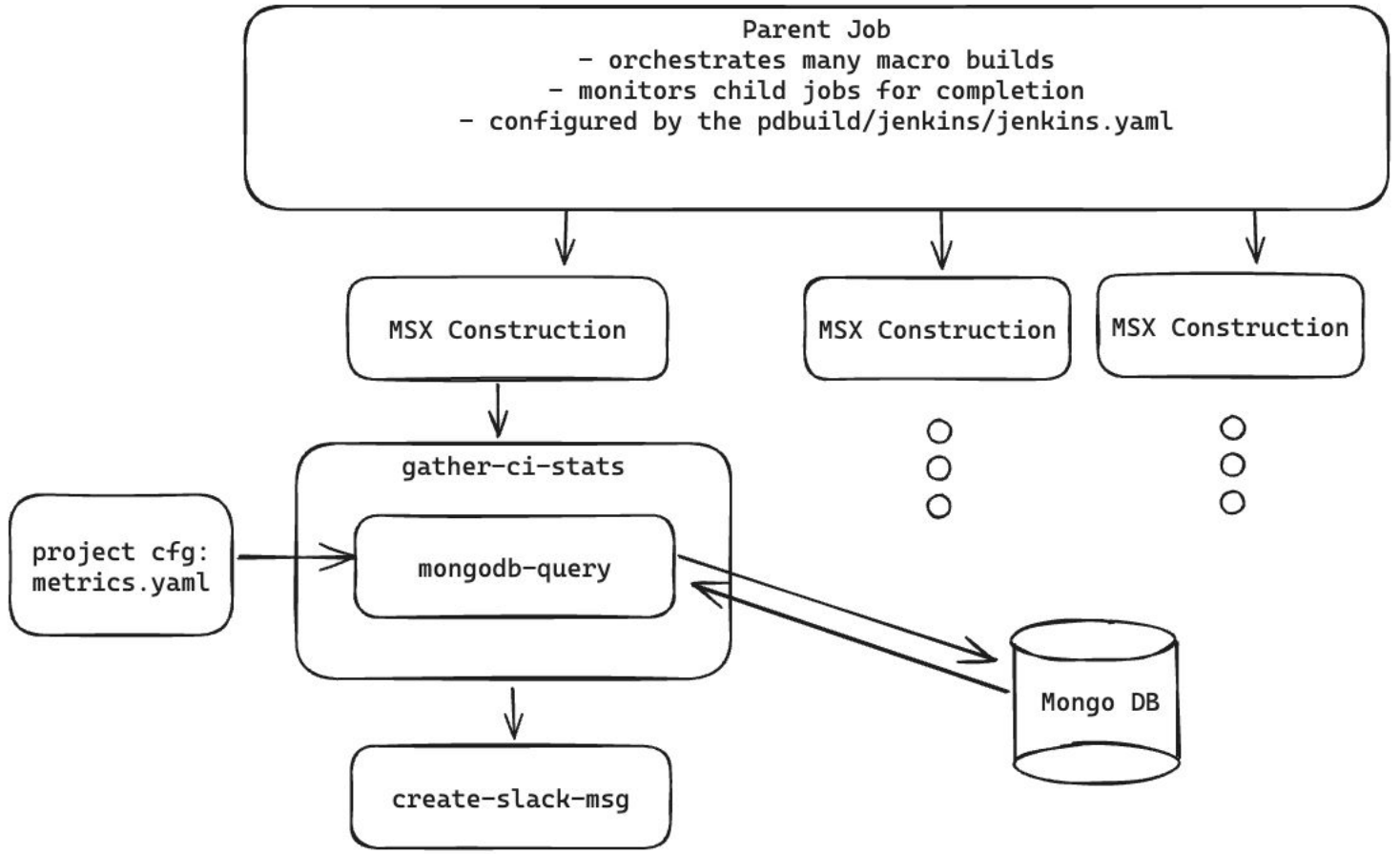


*Figure 6: Mark Cohen, CI Metrics Flowchart*

# Micro Scale of Project

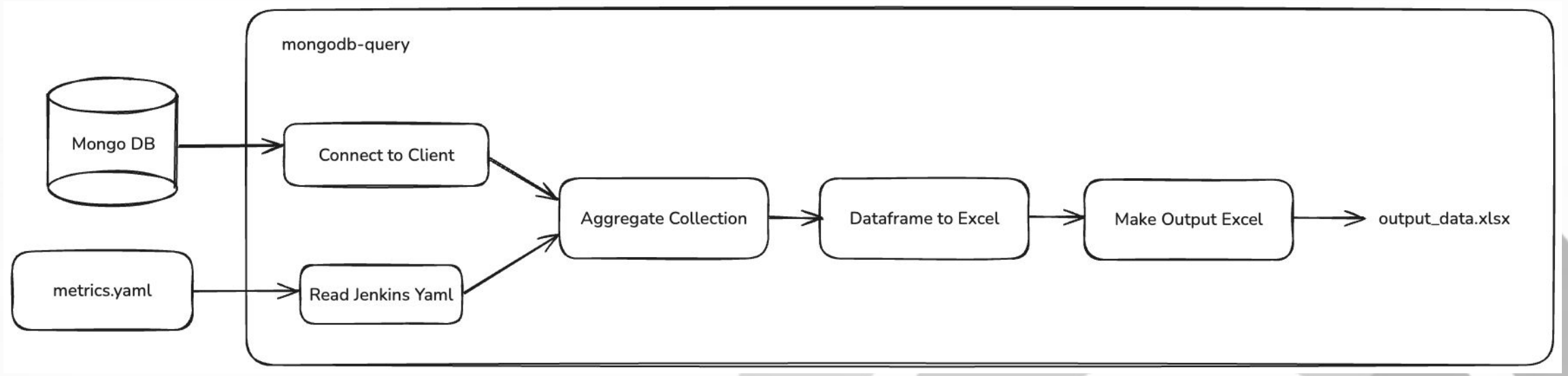


*Figure 7: Alec Bender, mongo-query flowchart*

# CSV Visualization



Above success threshold

Below success, above failure

Below failure threshold

## Include Warnings

| | user_id | l2l_fom | bonn_wace4_ALL | l2l_worst_slack |
|---|---|---|---|---|
| LS_DERT_MAC | chamilt | -402 | 91 | -10 |
| LS_EADA_MAC | chamilt | -850 | 95 | -11 |
| LS_EADV_TOP_MAC | chamilt | -92 | 104 | 4 |
| LS_EXEL_TOP_MAC | chamilt | 0 | 96 | 10 |
| LS_MIDL_MAC | chamilt | -1736 | 100 | -13 |
| LS_SDQD_TOP_MAC | chamilt | -413 | 105 | 3 |
| LS_SOUTH_MAC | chamilt | -3539 | 91 | -30 |
| LS_SRQHM_MAC | chamilt | -25 | 103 | -4 |
| LS_SRQZL_MAC | chamilt | -206 | 96 | 2 |
| LS_SRQZR_MAC | chamilt | -187 | 103 | 2 |
| EL_LSU | chamilt | | | |
| SD_DISPATCH_MAC | junchen | -12615 | 89 | -36 |
| SD_ISQ_MAC | junchen | 0 | 93 | 2 |
| SD_ISQ_REQ_CNTL_MAC | junchen | -41807 | 91 | -44 |
| LS_RADA_MAC | chamilt | -2663 | 99 | -17 |
| LS_LRQFL_MAC | chamilt | -2190 | 110 | -12 |
| LS_PRQ_LBS_MAC | chamilt | -136 | 95 | 2 |

## Without Warnings

| | user_id | l2l_fom | bonn_wace4_ALL | l2l_worst_slack |
|---|---|---|---|---|
| LS_DERT_MAC | chamilt | -402 | 91 | -10 |
| LS_EADA_MAC | chamilt | -850 | 95 | -11 |
| LS_EADV_TOP_MAC | chamilt | -92 | 104 | 4 |
| LS_EXEL_TOP_MAC | chamilt | 0 | 96 | 10 |
| LS_MIDL_MAC | chamilt | -1736 | 100 | -13 |
| LS_SDQD_TOP_MAC | chamilt | -413 | 105 | 3 |
| LS_SOUTH_MAC | chamilt | -3539 | 91 | -30 |
| LS_SRQHM_MAC | chamilt | -25 | 103 | -4 |
| LS_SRQZL_MAC | chamilt | -206 | 96 | 2 |
| LS_SRQZR_MAC | chamilt | -187 | 103 | 2 |
| EL_LSU | chamilt | | | |
| SD_DISPATCH_MAC | junchen | -12615 | 89 | -36 |
| SD_ISQ_MAC | junchen | 0 | 93 | 2 |
| SD_ISQ_REQ_CNTL_MAC | junchen | -41807 | 91 | -44 |
| LS_RADA_MAC | chamilt | -2663 | 99 | -17 |
| LS_LRQFL_MAC | chamilt | -2190 | 110 | -12 |
| LS_PRQ_LBS_MAC | chamilt | -136 | 95 | 2 |

Column background color relative to max and min

Warning becomes indicated as success

Some metrics may not include data and are indicated with a blank pattern

# Comparison between Statsio Automation



- Mongo Aggregate Spreadsheet
  - 35 line config.yaml
  - 271 lines of Python
  - 9 functions
  - Easily interpretable and configurable
  - Simple capabilities
  - Readily modifiable
  - **Qualitative analysis with threshold inclusion**

- Statsio
  - 32,814 line config.yaml
  - 3,270 lines of Python
  - 120 functions
  - High complexity
  - High capabilities and thorough output
  - Difficult to modify

# Future Steps

## Merge into pd-build main branch

- Requires inclusion of specific CI run “git_sha” (identification number)
- Automate start-up of aggregation when a CI is run and transfer git_sha

## Thorough Testing

- Aggregation only tested on a few CI runs, need to verify its success with a broader scope