

August 2023

Distributed AI in the Cloud Research

PREQS-2164

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Agenda

- Background Context
- Methods and Approach
- Study Structure
- Insights and Findings

Actionable with Recommendations (WTPK and VASP)

- Next Steps

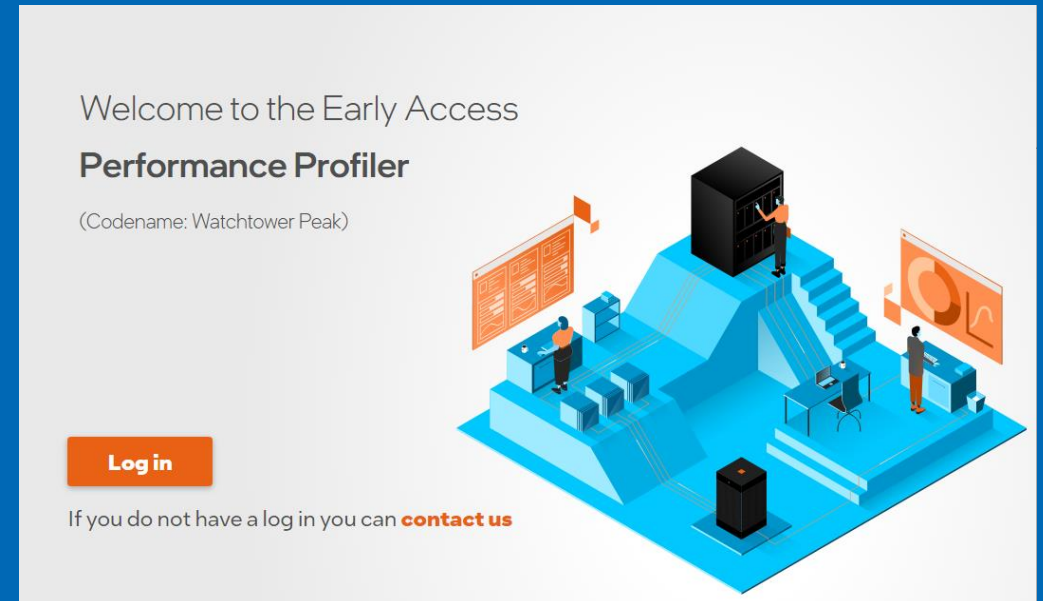
WTPK DX Roadmap (Olga)

Background Context

PREQS-2164

An initiative to modernize Intel's analysis tools in a SaaS offering. The project named Watch Tower Peak is the SaaS version of VTune.

<https://stable.perfprofiler-earlyaccess.intel.com/>



Background Context

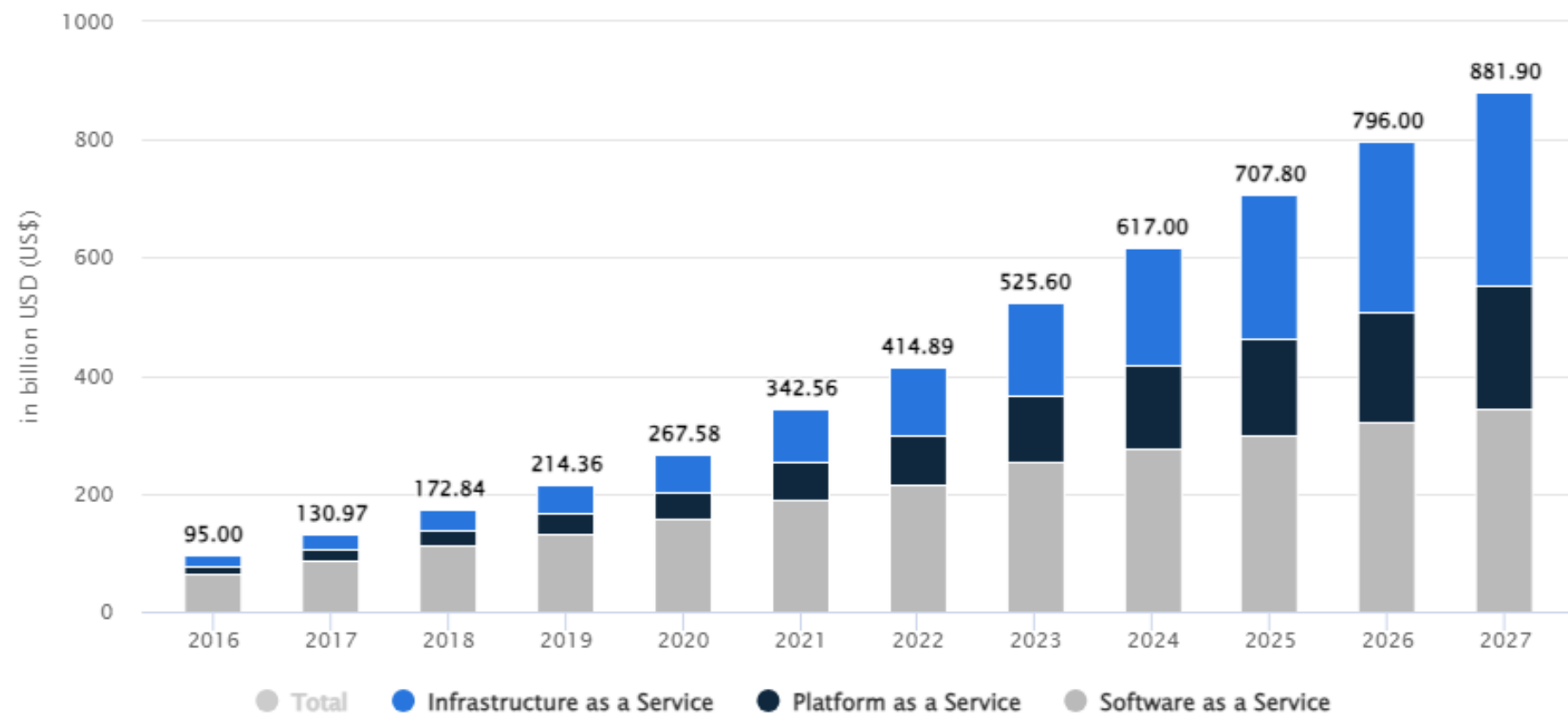
Main business or customer problem

- Customers need the ability to profile remotely in an interactive and persistent interface for collaboration.
- As multi-node and cloud computing continue to grow in popularity, the need for modern performance profiling tools is increasing.
- WTPK enables “profiling anywhere,” offering a single place to visualize results and enable collaboration in the cloud.
- It simplifies installation and allows profiling on multiple nodes, on-prem or in-cloud.

Why solve this problem?

- Cloud computing is the **foundation for all emerging technologies**, increasing the urgency for cloud workload characterization and profiling tools.
- **The public cloud market (annual revenue) will balloon to \$1 trillion by 2026**
- \$500 billion in 2023
(Gartner, Inc 2023)

REVENUE BY SEGMENT



Notes: Data shown is using current exchange rates and reflects market impacts of the Russia-Ukraine war.

Most recent update: Nov 2022

Source: Statista Market Insights

Background Context

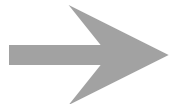
Research Goals and Objectives

Goals for Task-Based Assessment

- Confirm/challenge assumptions made during the previous design process.
- Understand user workflow (how they diagnose)
- Collect data showing the application is easy to navigate and tasks can be completed with minimal errors/issues.
- Use learnings for training development, design improvement, error message improvement, etc.
- Requirements and constraints gathering
- Competitive analysis tools

Research Questions

- Will users be able to complete the series of “memory leak” tasks without moderator intervention?
 - What are the pre-existing mental models?
 - How would they want to view aggregated data from multiple nodes?
- Mixed Methods Approach*



Methods and Approach

Research Methodologies

Part 1

Summative assessment of the usability and usefulness of our end-to-end flow for profiling on two nodes to gauge the current overall experience.

Part 2

Formative research with participant interview questions to probe mental models for task flow and experience with competitor tools.

Study Structure

Details

10 participants + 2 pilot participants

2-hour sessions

~10 min initial interview
(Participants background)

~1hr 30 min working on tasks

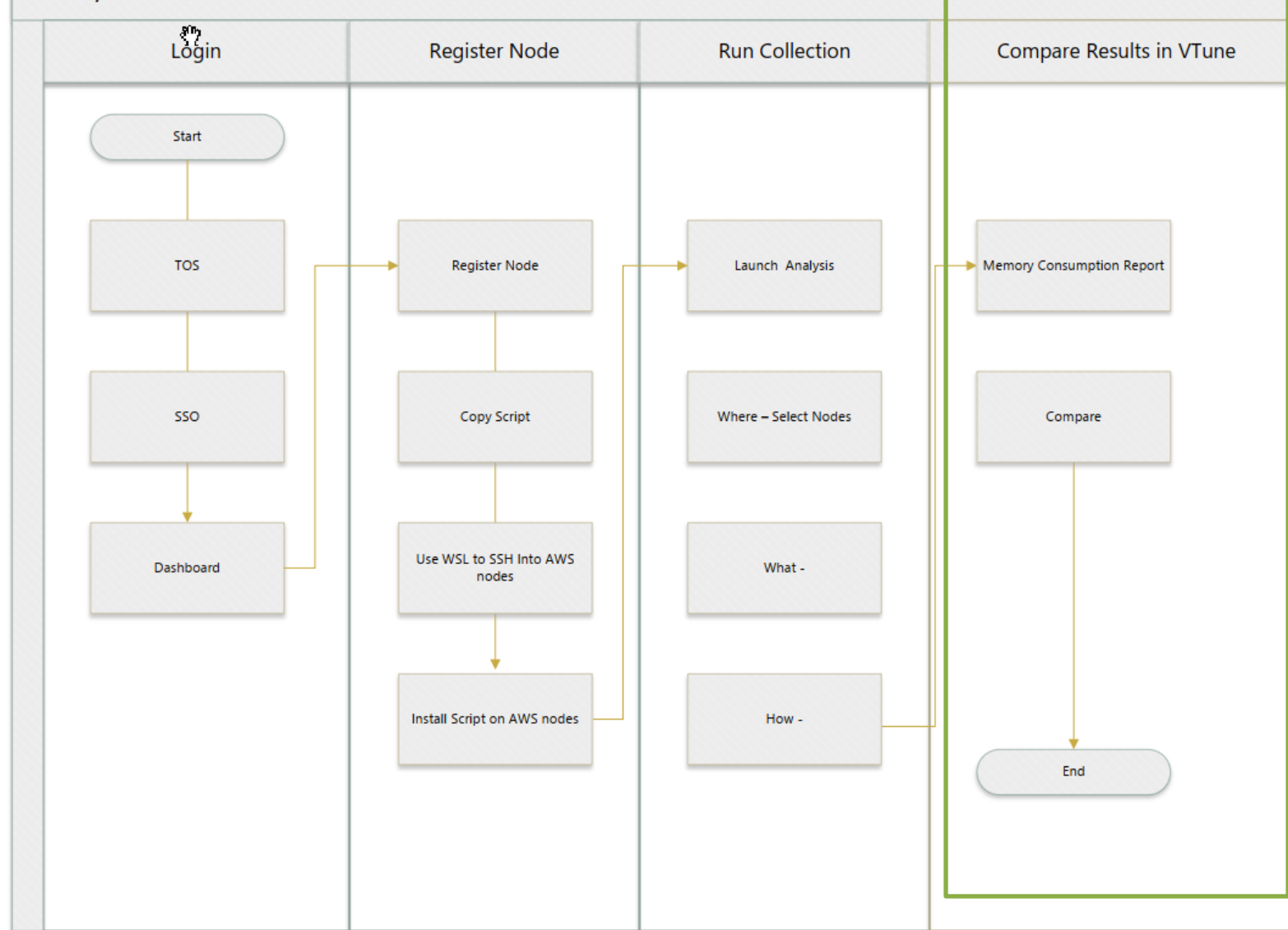
1. Get Started
2. Register Node
3. Launch Analysis
4. Review Results
5. Compare Results

~20 min interview to probe for more detail and understanding and ask persona/tool-related questions

Protocol

- Goal-oriented task
Think Aloud

VTune/WTPK Multi-node Task Flow



[Full journey for a target user \(P8\) can be tracked here](#)

Methods and Approach

System and Workload

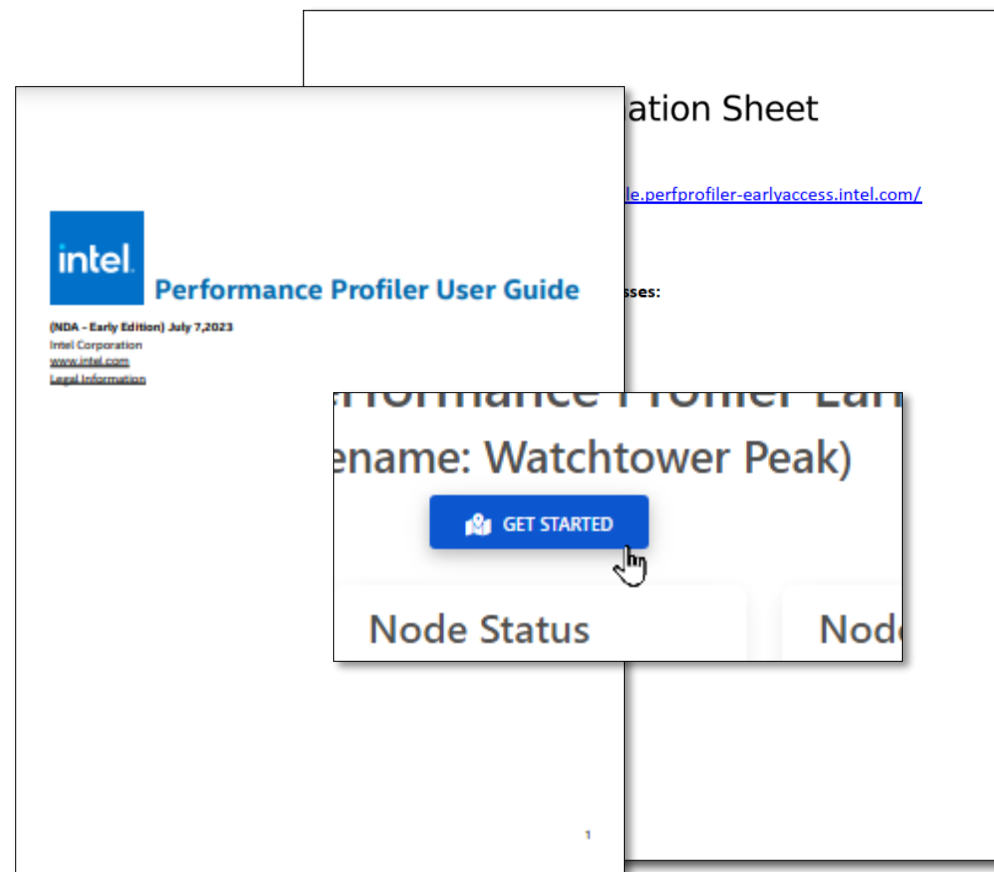
- <https://stable.perfprofiler-earlyaccess.intel.com/>
- Windows Machine
- WSL (for ssh into nodes) - workflow not tested
- System share over Zoom
- Two AWS nodes

Goal-oriented task
Think Aloud

Scenario:

“Assume you have access to a SaaS tool that allows you to collect and analyze performance data from a fleet of nodes; suppose that one node is having issues. You suspect you have a memory leak. How would you go about diagnosing it?”

Supporting Documents



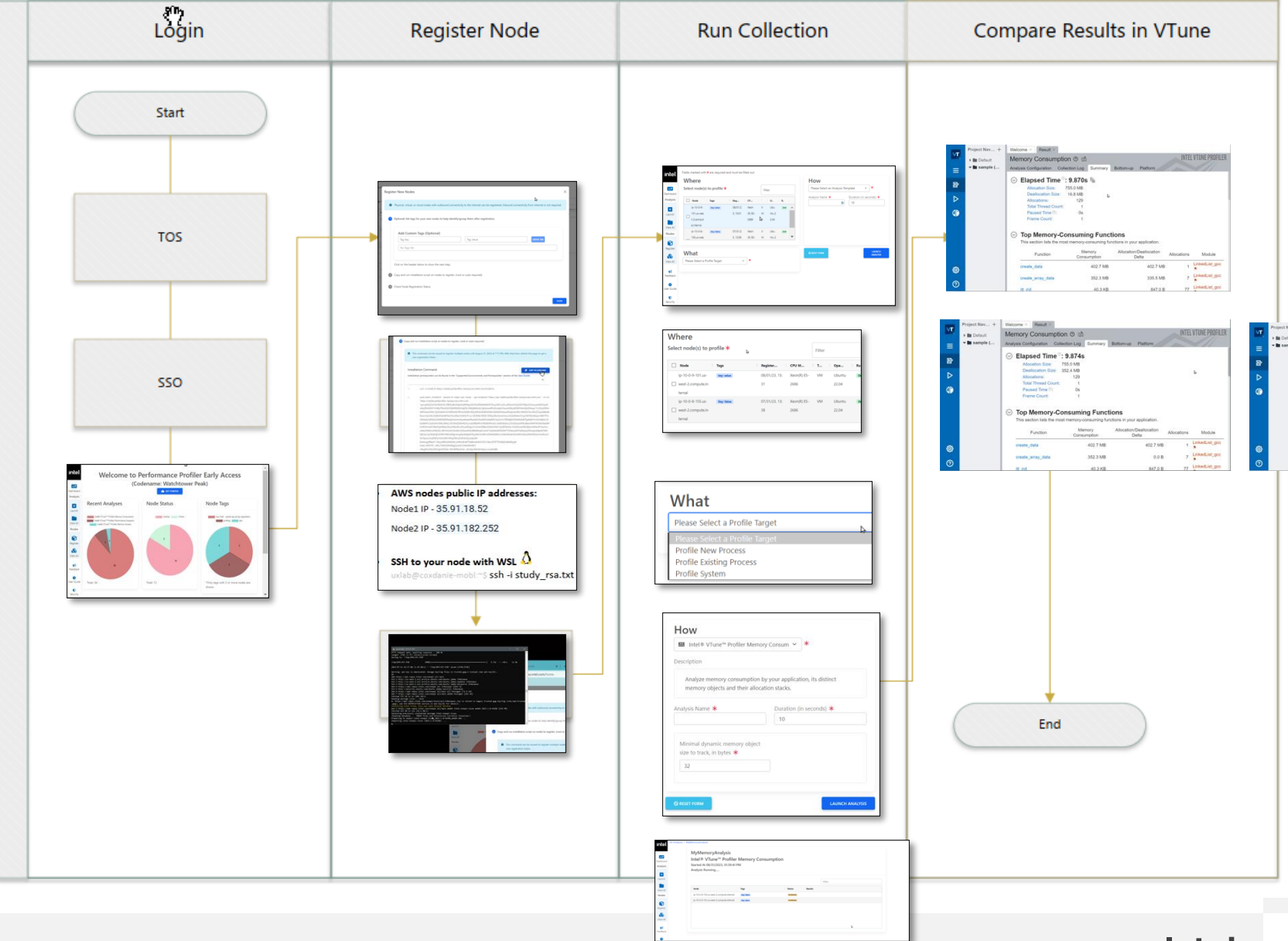
Participants

Participant	Job Role	Job Duties	Industry	Cl...	Languages
001 - Pilot - EU	Software Engineer on Paper -	I write app, application code for the company's product, as well as maintaining the infrastructure and working with monitoring tools for data ingestion, application performance, and, you know, general like alerting if there are any outages.	Electrical Grid Industry	Google Cloud Platform	Python, Java, Golang
002 - Pilot 2 - PA	level II Software Engineer	Empty	Software and technology	Microsoft Azure	C#, Python, Typescript
01 - Participant - CB	Senior Software Engineer	Developing code for systems and applications. I'm full stack, so I work on our client facing apps and on backend services. And then when I'm not developing new features or implementing bug fixes then we have an on-call system.	Coinbase. Financial Services (large currency exchange platform)	AWS	Golang,
02 - Participant - JT	Software Engineer	I take performance profiles, usually with the go profiling tools, and evaluate CPU and memory behavior to optimize the software. I consider data locality, branch prediction, and escape analysis.	IT - runs a PaaS that does load balancing, etc. for larger companies	AWS	Empty
03 - Participant - SG	Senior Software Engineer	Empty	Cloud platform that provides training and learning experiences at scale for employees, customers, and partners.	AWS	Python, Java, Golang
04 - Participant LD	Senior Software Developer	CPU performance analysis, debugginq memory leaks	Financial Services	Azure	C#
05 - Participant - VC	CPU Performance Modeling Engineer	Understand new micro architecture, build performance model projections, study multiple configurations, analyze performance metrics and scores. Deep diqs for performance debugginq.	Semiconductor	Empty	Empty
06 - Participant - SV	Principal Software Engineer	AT&T	Telecommunications	AWS	Java, JavaScript, bash
07 - Participant -SL	Senior Software Engineer (at Atlassian - scaling confluence, tests, increasing load, compliance related tasks)	Empty	software collaboration - Atlassian	-	Python, Java
08 - Participant - AF	Senior Software Engineer	I am a member of the capacity engineering team. We primarily focus on load testing, performance analysis, capacity estimation and automation of our capacity workflow.	Streaming media	Empty	Python, Java
09 - Participant - AM	Software Engineer	Empty	Defense & Space	AWS	Python, Java
10 - Participant - EJ O	Senior Software Engineer	MS	Computer Software SaaS	Azure	C#, C++, Python

VTune/WTPK Multi-node Task Flow

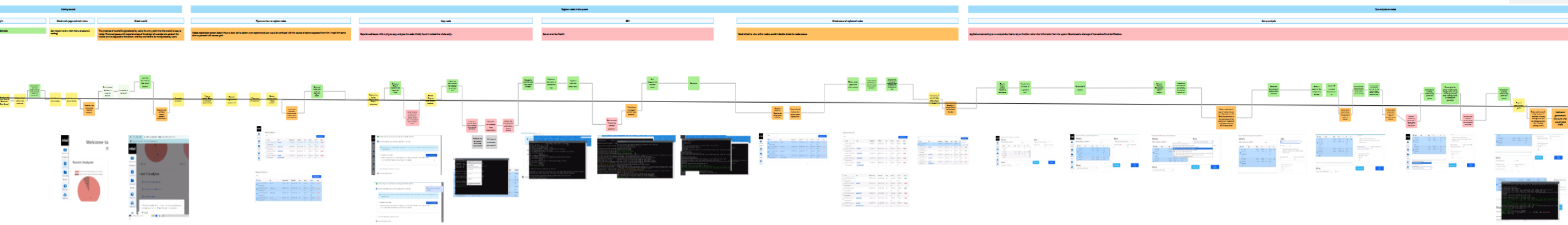
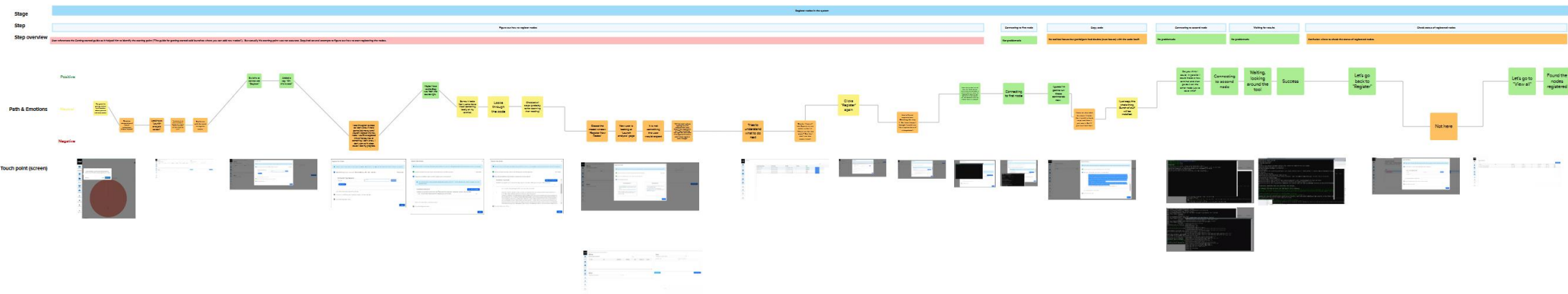
Scenario:

“Assume you have access to a SaaS tool that allows you to collect and analyze performance data from a fleet of nodes and suppose one node is having issues leading you to suspect a memory leak. How would you go about diagnosing it?”



Pilot P1

Pilot participant 1
Time of start:
12:30
Time of end:
29:18
Almost 17 mins



Insights and Findings

Actionable with Recommendations

Actionable Exploration Needed

Informative No Action Necessary

Noteworthy Takeaways



User mental models stem mostly from the use of monitoring tools



Node comparison may not be part of the standard workflow in memory leak diagnosis

(Exceptions are canary methods or Leak Canary tools)



Custom tooling used for observability and optimizations

Honorable mention - The different styles of the tune report versus WTPK GUI are not significant issues.

Jira Tickets - <https://jira.devtools.intel.com/secure/StructureBoard.jspx?p=602245857>

Key	Summary	Status	Theme
WTPK-2125	VTune Analysis Memory Consumption Report - Aggregated View	New	Aggregated view
WTPK-2060	As a user, I want the ability to save known or previous analyses	New	Dashboard
WTPK-2038	As a user I would like newAnalysis Form to include real-time validation of compatibility between WHAT/WHERE/HOW settings, so that I don't submit a job which cannot be successfully executed.Â	New	Launch analysis form
WTPK-2037	As a user, I want to select multiple results from my results job screen so that I can view an aggregated or comparison report.	New	Aggregated view
WTPK-2036	As a new user, I need UI improvements on the analysis form so that I can confidently complete an analysis	New	Launch analysis form
WTPK-2035	Add tag bug - from Registered node screen, editing tags for two nodes, create tags, doesn't work. (see video p2, 1:19) works but user didn't hit save changes.	New	Tagging
WTPK-2034	place memory and memory analysis types beside each other	New	Launch analysis form
WTPK-2033	As a user, I want an improved node registration process	New	Node registration
WTPK-2032	As a user, I want way to view progress summary of an analysis I have executed	Resolved	Launch analysis form
WTPK-2031	As a user, I need improved visual design on the navigation bar	New	lxD
WTPK-2030	As a user, I want the meaningful data at the top of my dashboard so I quickly complete my task.	New	lxD
WTPK-2029	As a user, I want to know if tag creation correlates to the install script so that I understand that every node that uses that exact install script will carry that exact same tag.	New	Tagging
WTPK-2028	As a user, I want the copy button placed directly next to my command so I know what is being copied.	New	lxD
WTPK-2027	As a new user, I need better clarity from the get started tutorial so I have clear next steps	New	Get Started
WTPK-2026	As a user, I'd like to be notified that I'll be logged out before declining TOS	New	Get Started
WTPK-2025	As a user, I want to unmask my password to know if I'm typing it correctly.	New	Get Started
EDXA-418	Name of result set should reflect the analysis execution name from WTPK in project navigator.	New	VTune Results
EDXA-419	Autodetect hostname and IP address of target system the agent is installed on	New	VTune Results
EDXA-420	Simplified graph for memory allocation and deallocation	New	VTune Results
E) EDXA-421	Bug when viewing results from node collection - create new project	New	VTune Results

WTPK STORIES

Actionable Insights

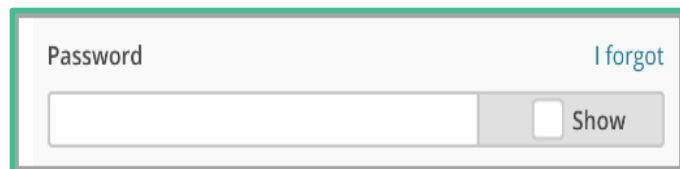
Masked passwords are less secure (forces users to copy-paste).

Users wasted time and were unnecessarily frustrated by minor login issues.

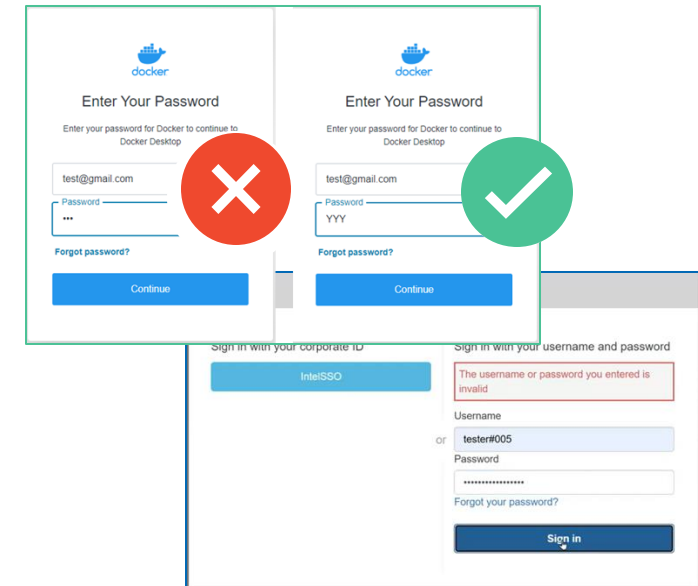
Pain point: P5 had problems with logging in with provided credentials, but he couldn't check if password he entered was correct or not.

Recommendation:

Unmask passwords



A prototype of a password input field. It features a text input box with the placeholder text "Password". To the right of the input box is a toggle switch labeled "Show". Above the toggle switch is a link that says "I forgot". The entire input area is enclosed in a green border.



Two login form prototypes are shown side-by-side. The left prototype is titled "Enter Your Password" and includes fields for "test@gmail.com" and a masked password "YYY". It has a "Continue" button and a "Forgot password?" link. A large red "X" is overlaid on this form. The right prototype is also titled "Enter Your Password" and includes the same email field, but the password field is unmasked, showing "YYY". It also has a "Continue" button and a "Forgot password?" link. A large green checkmark is overlaid on this form. Below these, a third prototype is partially visible, showing a "Sign in with your corporate ID" section with an "IntelSSO" button, and a "Sign in with your username and password" section with fields for "Username" (containing "tester#005") and "Password" (masked with "*****"). It includes a "Sign in" button and a message: "The username or password you entered is invalid".

Prototypes based on recommendations are complete

Actionable Insight

Getting started flow: Consent

Pain point: No choice to read or not read the whole text of Terms of service agreement (ToS) and Data collection consent form; no summary/highlights of the document provided.

P3: "I generally wouldn't read through these things".

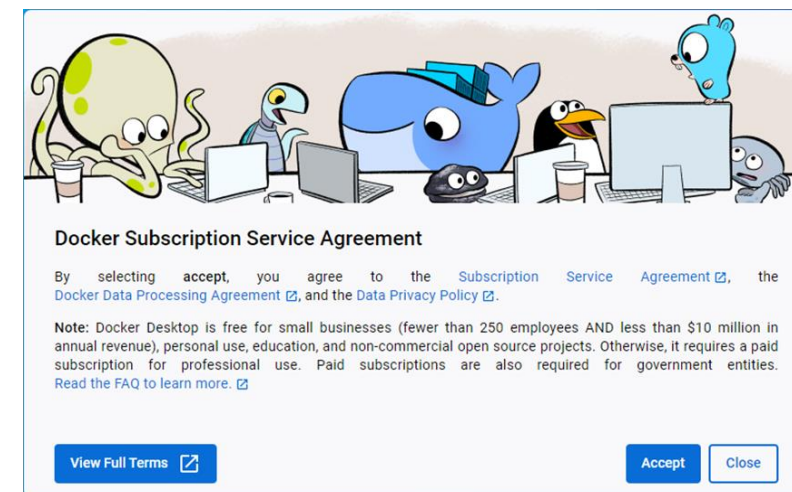
P4: "I'm going to read all of this very carefully".

Pain points: no radio buttons, no clear indication of what will happen if user will not consent to the terms.

P6: "I did decline. So this was not very intuitive. Usually, you may or may not read the whole print. I hope it would've been much intuitive if these both are not same call to action, meaning consent could be something on the top and do not consent could be either on this side or it could be some other form of click to action. Because this really confused me"

Recommendations:

- Minimum implementation: use radio buttons as the question is single-select, not multiple-select; clearly inform about the consequences after each action (what will be happening if consent is not accepted);
- More advanced implementation: provide choice to users: hide the details, show them only if a user wants to look through the details; adjust the format of the document to make it look more as a web-page, not a bureaucratic PDF; provide highlights/summary of the doc; provide clear call to action to consent.



Prototypes based on recommendations are complete

Actionable Insight

Getting started flow: Tutorial

Pain point: There are issues with responsiveness of the design of tutorials: the cards of the tutorial are not adjusted to the screen, and they are hard to be manipulated by users.

P8 had an issue with tutorial window: "I cannot close it".

Pain points: Content of the tutorial is not matching the titles/naming of interface elements (main menu).

P1 "Minor copy issues"

P6 "Ambiguity in terms of naming"

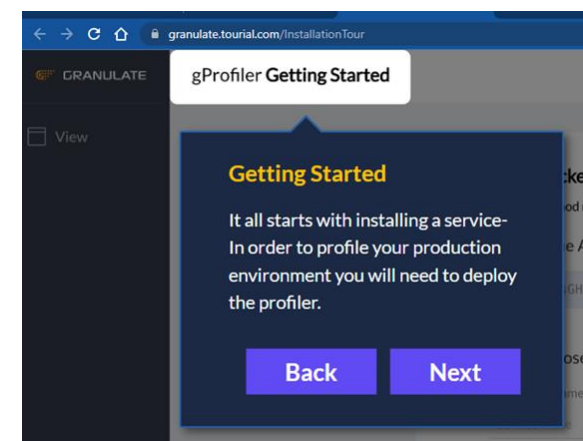
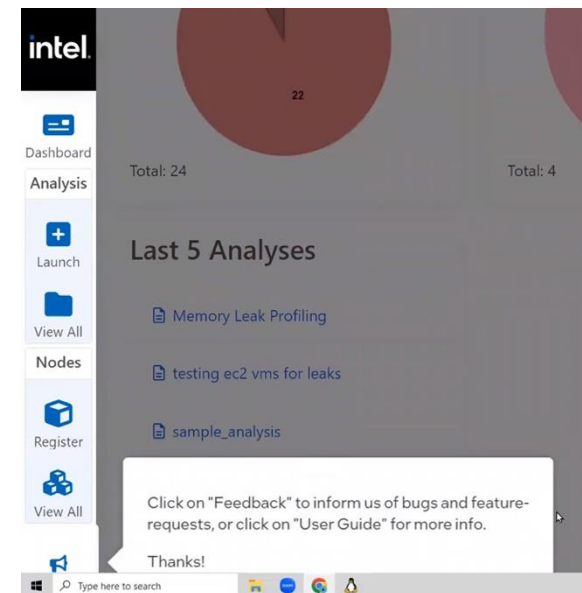
Recommendations:

[Minimum implementation] Make tutorial windows responsive.

[Advanced implementation] Consider revision of tutorial windows format/design (check references).

- Review naming/texts used in tutorial in make them consistent with naming of interface elements.

[Detailed feedback on getting started experience for Design team](#)



Actionable Insight

Navigation bar perceived negatively

"Hmm, launch is an interesting name for analysis" P8

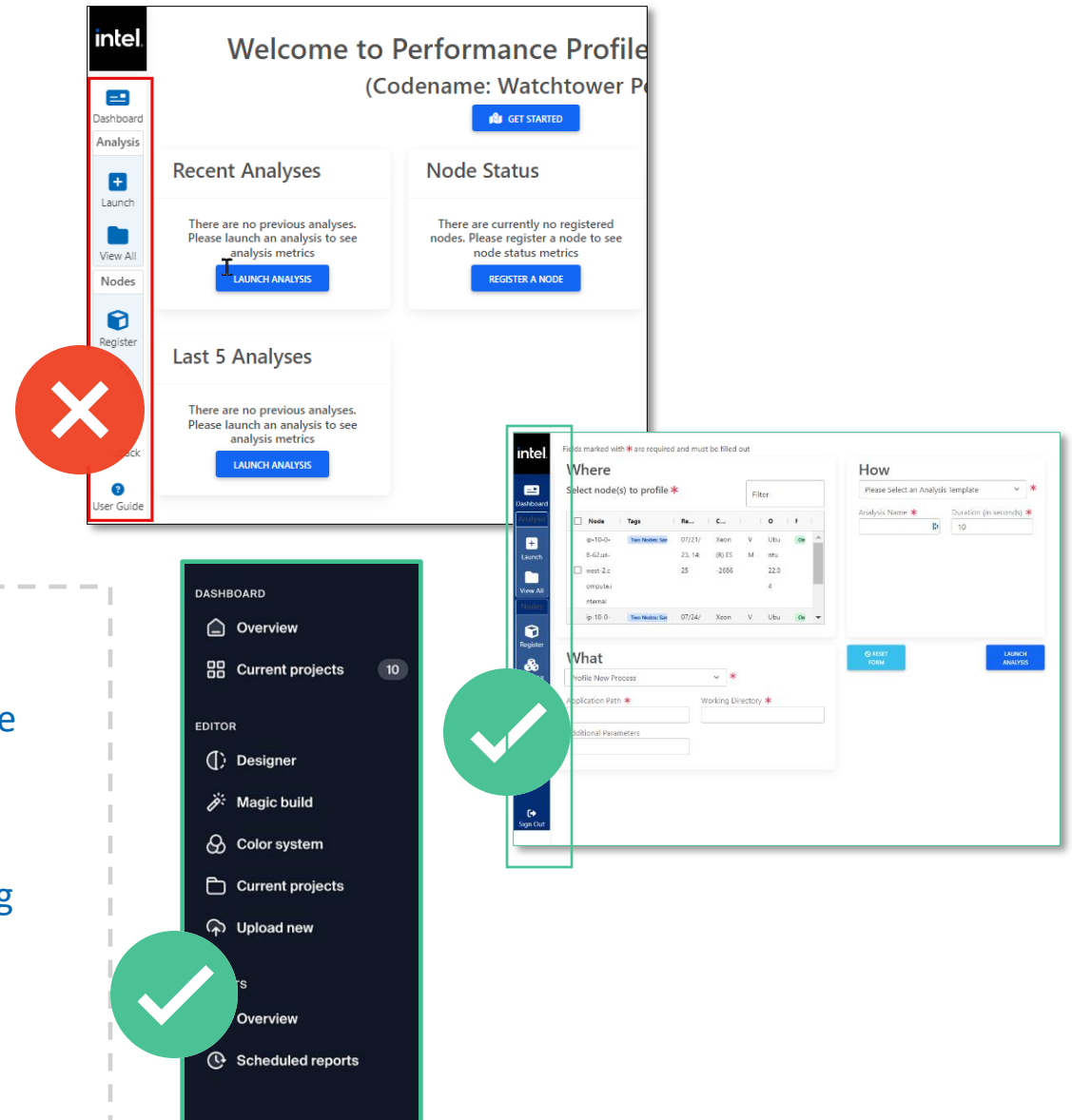
"I hate this scroll bar, seems like it's in an iframe or something" P4

Recommendation:

Use contrast, color schemes, and other visual tricks to highlight the background and clickable elements. Highlight the bar as a critical navigation element.

Whitespace/separation between navigation sections (see chunking example)

Use intuitive and conventional language and icons (nav bar should answer questions—not create them)



Actionable Insight

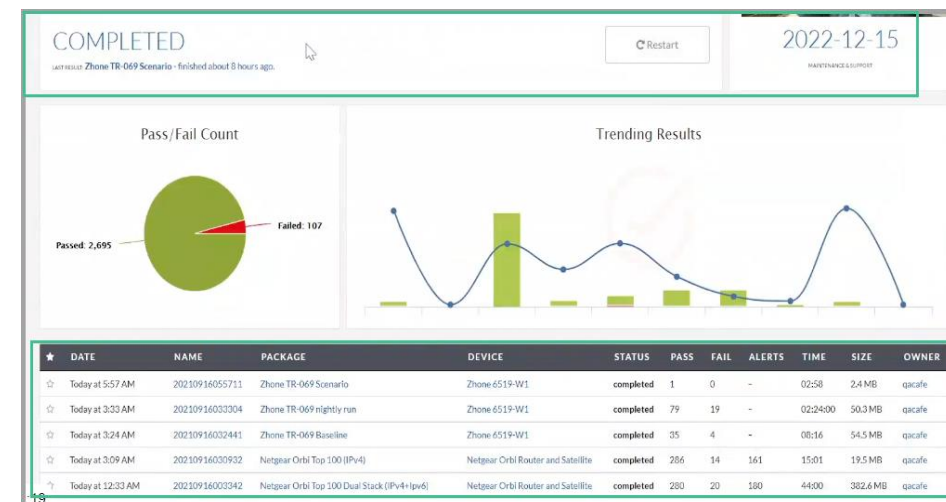
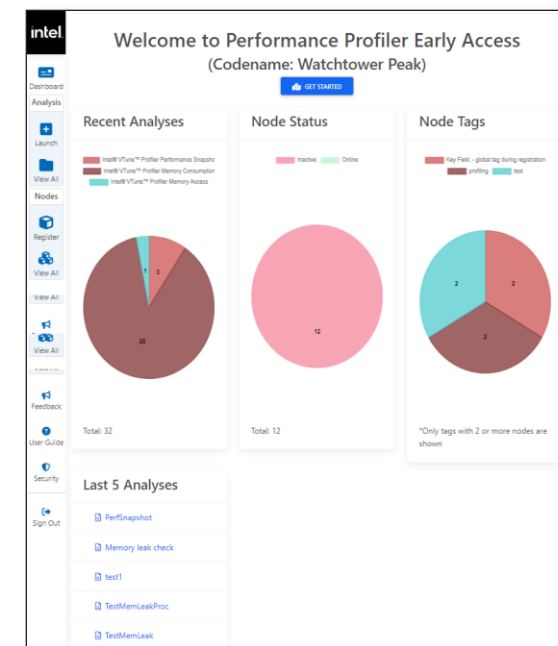
Elements on the dashboard should follow the user's pattern of inquiry and provide a clear pathway to info that will help them in their investigations.

Participants found recent activity most helpful.

Recommendations:

Move recent activity to the top. Improve relevance of charts and graphs.

See additional ideas from participants in Jira.



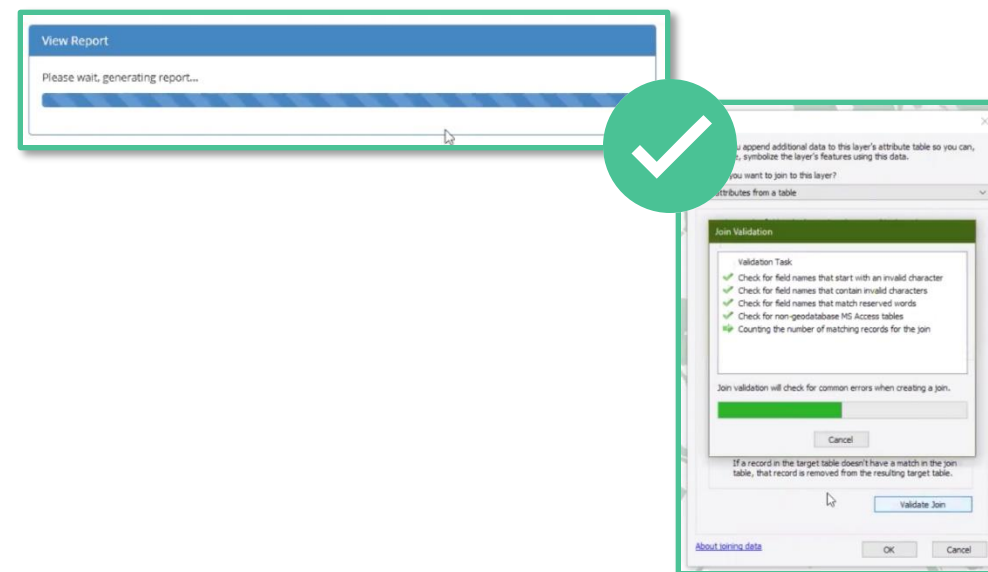
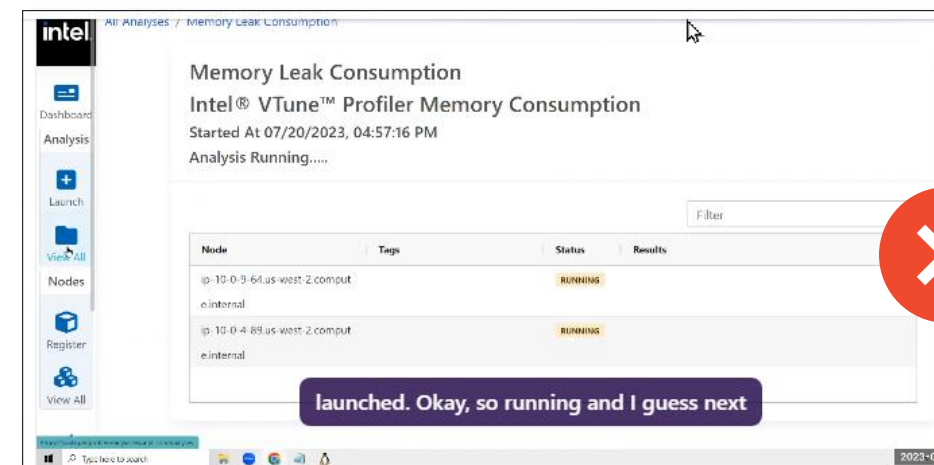
Actionable Insight

Progress Indicators Make a Slow System Less Insufferable

Recommendations:

While users are waiting, inform what is happening such as: elapsed time, steps completed, steps remaining.

See <https://jira.devtools.intel.com/browse/WTPK-2032>



Actionable Insight

Nodes registration flow: Tutorial

Tutorial is not providing obvious suggestion on how to get started with new nodes registration

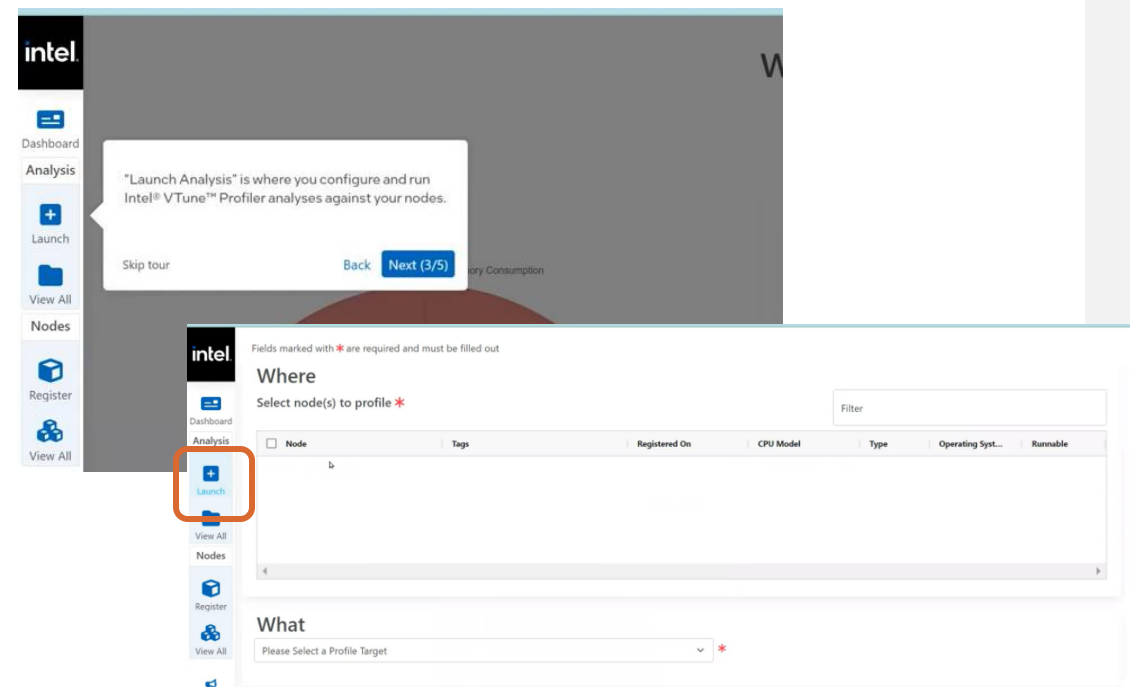
Pain point: Participant tried to use guidance from Tutorial to get started with new nodes registration process but interpreted it not very accurately.

P1 Pilot referred to Getting started guide when decided on his starting point: "The guide for getting started said "Launch" is where you can add new nodes."

Recommendations:

Reflect nodes registration process in the tutorial, setting correct expectation on entry points and first actions in the system.

See <https://jira.devtools.intel.com/browse/WTPK-2027>



CJMs

New nodes registration flow was mapped in detail for 2 participants:

- Pilot participant 1 had problems with figuring out how to register nodes (spent almost 17 mins on the task);
- Participant 8 didn't find the way to get started with nodes registration immediately as well and had problems with coping the code and establishing the connection.

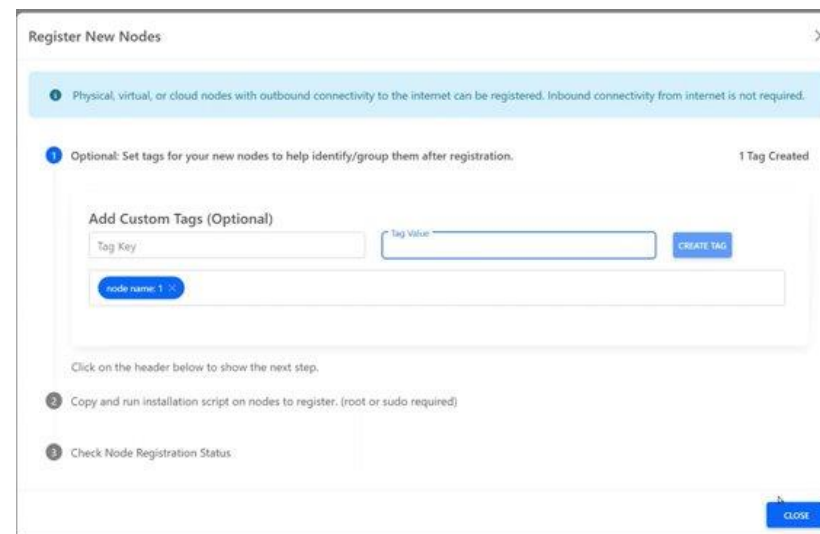
Mural board

Actionable Insight

Nodes registration flow: Layout/Flow

Navigation between steps is not straightforward; Modal window format is limiting

P1 Pilot [After adding tags] "I see this option to close, so I don't know if that's gonna kick me out and I wouldn't register the new node. I would've expected this to like say next or something. I don't want to hit close cause I lose my progress".



Recommendations:

Create more transparent step by step flow:

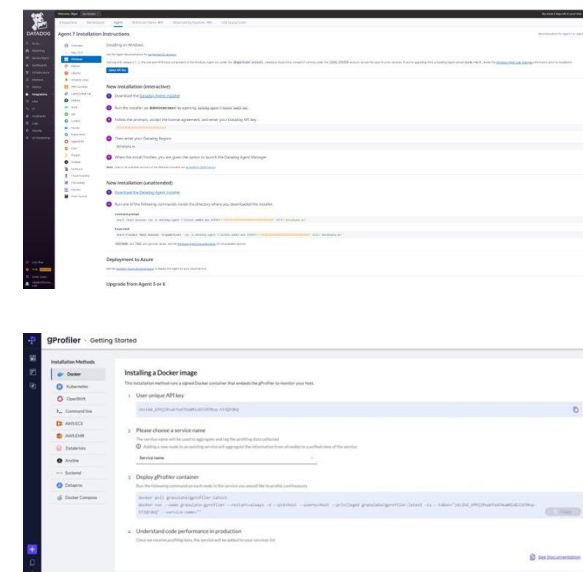
- Get rid of modal
- Have registration flow presented in a separate section
- Show each step (don't hide it and make a user to expand/collapse the steps).

References: agent installation at Datadog; getting started at Granulate.

Redesign based on recommendations is completed

[Detailed feedback on nodes registration flow for Design team](#)

See: <https://jira.devtools.intel.com/browse/WTPK-2033>

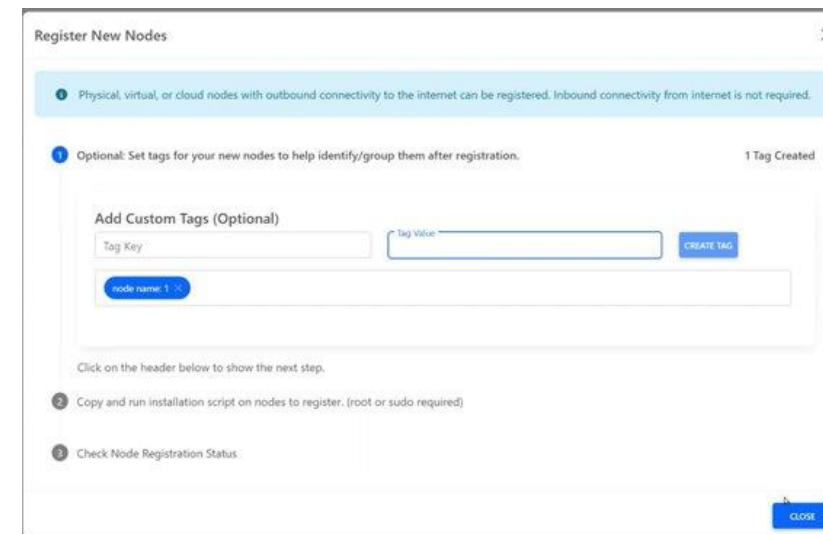


Actionable Insight

Nodes registration flow: Tagging

Tags were generally positively perceived by users; "adding tags" step can be simplified and better explained.

P3 "Tagging is helpful because you would definitely want your nodes to be differentiated or want to be able to find those notes later. I didn't understand the key value part there. There was like tag key and tag value. I'm not sure like what would like these two different values would do. When I think about tagging, I think of a single value and that value would just I could filter after I've assigned the tag with a particular tag value, then I could filter those notes based on that tag value. I'm not sure like what these two different values were, but tagging as a concept there is really helpful."



Recommendations:

- Demonstrate that tags added are influencing the code script (discussed with team);
- Consider renaming fields associated with tags to reflect their purpose more accurately:
 - Use "Group" or "Category" instead of "Tag name"
 - Use "Tag" instead of "Tag value".
- Consider optimizing format (discussed with team that 2 fields for a tag is not a must, no technical restrictions).

Redesign based on recommendations is completed See <https://jira.devtools.intel.com/browse/WTPK-2035>
See <https://jira.devtools.intel.com/browse/WTPK-2029>

[Detailed feedback on tagging for Design team](#)

Actionable Insight

Nodes registration flow: Copy code & Instructions

Pain points: User hasn't noticed "Copy code button"; User hasn't noticed that the code section can be expanded; Allocation of "Copy code" button is not handy; Code is not fully visible immediately in the instructions; Code is not trusted by the users.

P2: "It's a little weird that the button is above this text. ... I don't really like the collapse (which is hiding the code) there."

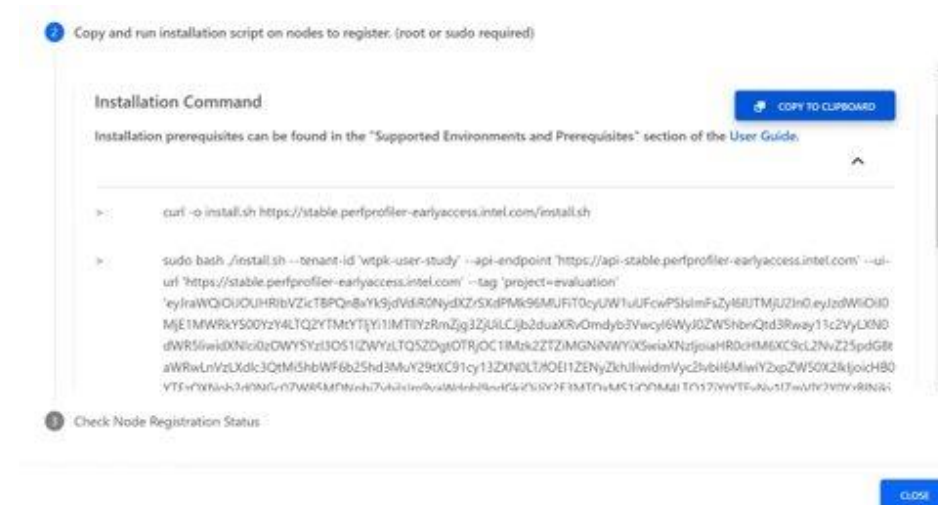
P1: "It might just my perception, but at least it doesn't feel like I have to install all these extra packages with root".

Recommendations:

- Make code easy to read
- Explain the code
- Make possible to copy code after it was read by the user.

Redesign based on recommendations is completed

<https://jira.devtools.intel.com/browse/WTPK-2028>



Actionable Insight

Nodes registration flow: Success/Failure status

Pain points: Information overload at the Nodes Registration Status step; If needed, it is hard to return for troubleshooting.

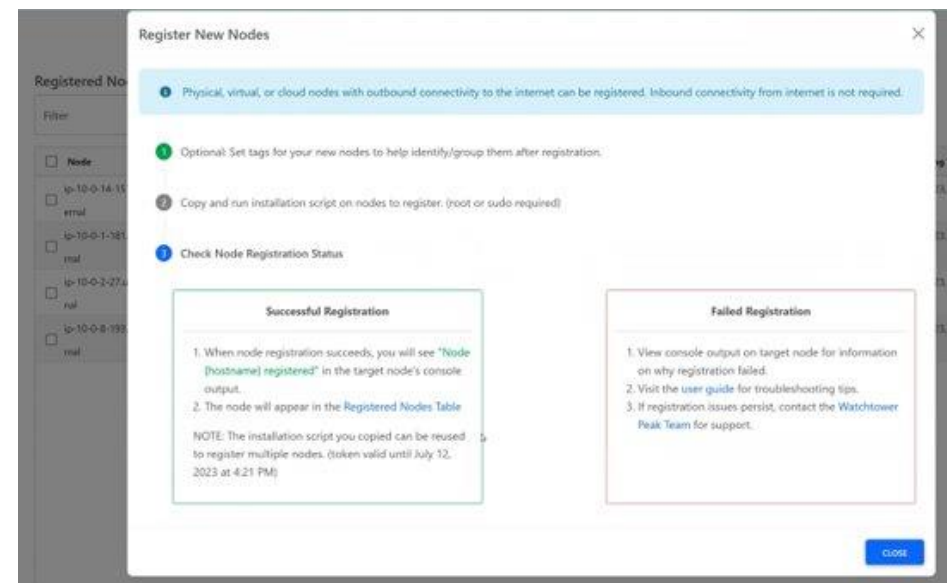
P1: "Looks like a lot of information to consume here ... It's kind of hard to go back to the troubleshooting support flow basically"

P2: "It is helpful to see full connectivity. Would be great to have a refresh every 5 seconds and see new nodes popping up".

Recommendations:

- Redesign step 3 of the new nodes registration process:
 - Add a progress bar
 - Show how we will message about success/failure of new nodes addition
 - In case of success, show a text message with number of nodes added and a list of their identifiers
- ? In case of failure, provide hints what to do to trouble shoot
- ? Add link to documentation (Granulate reference).

Redesign based on recommendations is completed



Actionable Insight

Nodes registration flow: Registered nodes table

Pain points: no automatic refresh in new nodes registration list; no clear nodes registration option from the list.

P4 about "Node Action" button: "It is scary".

Recommendations:

- Add automatic refresh of registered nodes list (d that team is already working on this);
- Think about dividing actions in the menu:
 - ☐ actions associated with the existing nodes
 - ☐ actions which are not dependent on existing nodes (e.g. register new nodes).

Redesign based on recommendations is completed

Registered Nodes (10)

Node Actions

id	Tags	Registered On	CPU Model	Type	Operating Sy...	Last Ping Time	Status
<input type="checkbox"/> steve-test-3.c.gcp-watchtower-peak.i	foo: bar InstanceType: E2 Owner: steve	05/22/23, 12:03	Xeon(R) @	VM	Ubuntu 22.04	08/17/23, 16:02	Online
<input type="checkbox"/> internal	test: key						
<input type="checkbox"/> ip-10-255-0-150.us-west-2.compute.	guardian: bob hello: bar	07/13/23, 09:55	Xeon(R) 8259CL	VM	Ubuntu 22.04	08/17/23, 16:01	Online
<input type="checkbox"/> internal	testing long key: SuperCalifragilisticexpialidocious xxx: ddd						
<input type="checkbox"/> ip-10-0-0-104	3423: 2432 Doyoumeanflame: YassinaQueen	07/31/23, 09:33	Xeon(R) 8259CL	VM	Ubuntu 22.04	08/17/23, 09:17	Inactive
<input type="checkbox"/> ip-10-0-0-227	temp: tag						
<input type="checkbox"/> ip-10-0-0-181	InstanceType: E2 Owner: steve	05/22/23, 12:20	Xeon(R) 8259CL	VM	Ubuntu 22.04	05/23/23, 12:18	Inactive
<input type="checkbox"/> cloud42984	Platform: AWS						
<input type="checkbox"/> ip-10-0-13-199.us-west-2.compute.i	Owner: Steve Platform: AWS	06/01/23, 09:52	Xeon(R) 8259CL	VM	Ubuntu 22.04	06/01/23, 10:05	Inactive
<input type="checkbox"/> cloud41999	Doyoumeanflame: YassinaQueen	08/17/23, 13:45	Xeon(R) 8480+	VM	Ubuntu 22.04	08/17/23, 16:02	Online
<input type="checkbox"/> ip-10-0-13-199.us-west-2.compute.i	Internal	06/30/23, 12:53	Xeon(R) E5-2686	VM	Ubuntu 22.04	07/07/23, 11:07	Inactive
<input type="checkbox"/> cloud41999	idc: is owner: dklm tabi: asdfghjklm	08/02/23, 15:15	Xeon(R) 8480+	VM	Ubuntu 22.04	08/02/23, 15:49	Inactive
<input type="checkbox"/> ip-10-0-9-199.us-west-2.compute.int	Doyoumeanflame: YassinaQueen	07/24/23, 11:20	Xeon(R) 8259CL	VM	Ubuntu 22.04	07/29/23, 11:29	Inactive
<input type="checkbox"/> internal	Owner: Kulsara Platform: AWS						
<input type="checkbox"/> ip-10-0-13-114.us-west-2.compute.i	Purpose: testingNodeAggregation						
<input type="checkbox"/> internal	Type: t3.large	06/30/23, 12:37	Xeon(R) E5-2676	VM	Ubuntu 22.04	07/07/23, 11:08	Inactive

Actionable Insight analysis form

Form errors should be signaled through various cues, not solely through color.

Context should be communicated through various cues, tool-tips, intuitive naming of process/options

Erroneous input should be preserved so users can correct it and be accompanied by a specific explanation of the problem.

Recommendations:
Tooltip hovers for form sections (Where, What and How).

Keep the asterisks but use a different contrasting color. Grayed out (unavailable options) should remain in view and needs a contrasting color.

See <https://jira.devtools.intel.com/browse/WTPK-2036>

The image displays two versions of the 'Actionable Insight' analysis form, comparing different error handling and context communication strategies.

Top Version (Red X): This version shows a form with several fields marked with red asterisks (*). A red error message at the top states: "Fields marked with * are required and must be filled out". The 'Where' section has a red error message: "Please Select at least one node". The 'How' section has a red error message: "Please Select an Analysis Template". The 'What' section has a red error message: "Profile New Process". The form includes buttons for "RESET FORM" and "LAUNCH ANALYSIS". A large red 'X' icon is overlaid on the right side, indicating a poor or incorrect approach.

Bottom Version (Green Checkmark): This version shows the same form with a green checkmark icon overlaid, indicating a recommended approach. It features a tooltip for the 'Where' section: "This is the remote system (node) where the VTune agent is installed and where a profiling session runs." The 'How' section has a tooltip for the 'Destination' dropdown: "International travel is options are not available to enable this option must be enabled by your travel agency." The form also includes a 'Destination' dropdown menu with options: Berlin, Chicago, New York, Philadelphia, Paris, San Francisco, Seattle, and Toronto. The 'What' section has a tooltip for the 'Profile New Process' dropdown: "Profile New Process". The form includes buttons for "RESET FORM" and "LAUNCH ANALYSIS".

Actionable Insight Compare Results

Results comparison across multiple analysis reports is important for helping users find their issues.

MVP would compare reports from the same analysis types/template family or job.

Recommendations:

Mechanism to select individual results inside of a job.
"Compare" or "View" button
Should open a compare or aggregated view of VTune results. See next slide.

<https://jira.devtools.intel.com/browse/WTPK-2037>

The screenshot displays the Intel VTune Profiler interface. At the top, a panel titled "running again Intel® VTune™ Profiler Memory Consumption" shows a table of analysis results. Below this, a larger panel titled "Results" contains a table with columns: DATE, NAME, PACKAGE, DEVICE, STATUS, PASS, FAIL, TIME, SIZE, OWNER, and TAGS. A red circle highlights the first three rows of this table. Below the "Results" panel, a detailed view of a specific analysis titled "Memory Consumption" is shown, completed at 08/31/2023, 02:52:01 PM. This view includes a table with columns: Node, Tags, and Status. The "Node" column lists three IP addresses, the "Tags" column lists various tags like "Tag 1: test" and "Tag 2: cloud", and the "Status" column shows "COMPLETED". To the right of the "Status" column are buttons for "VIEW RESULT", "VIEW LOG", and "RESULT SET".

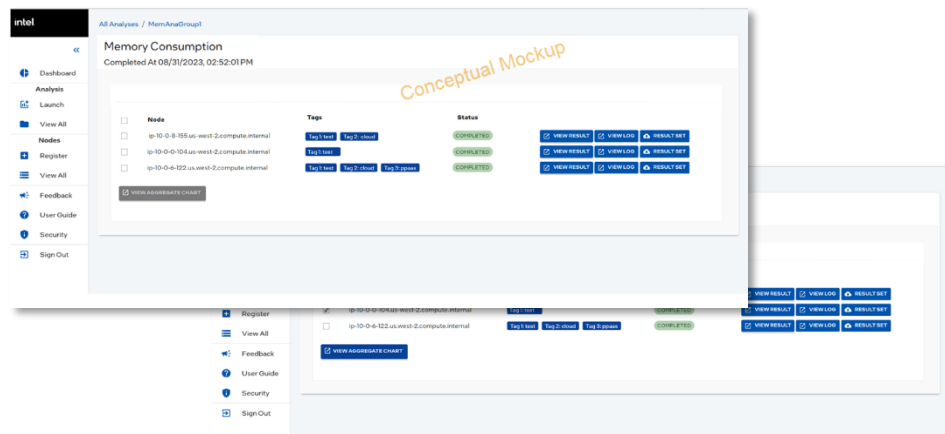
DATE	NAME	PACKAGE	DEVICE	STATUS	PASS	FAIL	TIME	SIZE	OWNER	TAGS
2016-11-21 at 12:39 AM	20161121003926	Verizon-FIOS-G1100_wireless	none	completed	126	2	01:10:37	5.7 MB	podbrain	podbrain
2016-11-20 at 11:43 PM	20161120234338	Verizon-FIOS-G1100	none	completed	140	2	01:15:31	18.5 MB	podbrain	podbrain
2016-11-20 at 11:40 PM	20161120234038	D-link_DIR-655_mac_filtering_blacklist	none	completed	5	0	02:32	273.5 KB	podbrain	podbrain

Node	Tags	Status
ip-10-0-8-155.us-west-2.compute.internal	Tag 1: test, Tag 2: cloud	COMPLETED
ip-10-0-0-104.us-west-2.compute.internal	Tag 1: test	COMPLETED
ip-10-0-6-122.us-west-2.compute.internal	Tag 1: test, Tag 2: cloud, Tag 3: ppaas	COMPLETED

"I would've been able to see them like literally like side by side and see like this allocate size and these allocate size and this, I would've like, okay, but I'll just go on back and forth and I like got desensitized to like, these big numbers are like, oh, these are similar and these numbers are also similar." P2

VTUNE STORIES

Actionable Insight aggregated view



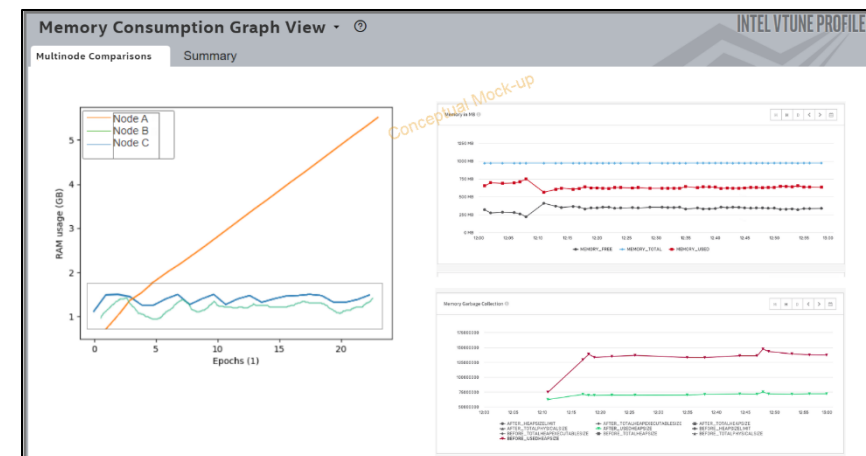
Recommendations:

Provide an "aggregate view" task-flow which starts in WTPK. As MVP start with page where users view their grouped/completed analysis

When comparing, in some cases it's like it's better to run in multiple configurations in one qo. And so the pain point is how to select those and how to run them in parallel. Ideally, in the end you, you would like to have some kind of automated summary where, where it can pinpoint the differences. We, we don't have something like that. It's, it, it requires lot of manual effort.

“

”



<https://jira.devtools.intel.com/browse/WTPK-2125>

Actionable Insight

The Project Navigator added more confusion than value.

For recommendation 1, implementation was presented by Nika (VTune front end team) at Analyzers Architecture meeting on Sept 28

VASP-28945, VASP-28944
Adapting VTune Gui for WTPK purpose

Recommendations:

(1) For case when user is checking analysis results launched at WTPK, make page more focused on results and remove distractions such as project navigator (but keep navigation elements for comparison feature). (updated by Olga on Sept 28)

(2) Add the group analysis name, that the user created in WTPK, to the report. Note, also add date/time date creation.

The top screenshot shows the Intel VTune Profiler interface with the 'Project Navigator' on the left. A red arrow points to the 'sample (matrix)' entry. The main panel displays 'Memory Consumption' results for 'sample (matrix)' with an elapsed time of 9.875s. The bottom screenshot shows the same interface but with the 'Project Navigator' removed, focusing on the 'Memory Consumption' results. A green box highlights the results, and a green checkmark in a circle is overlaid on the right side.

Memory Consumption

Elapsed Time: 9.875s

- Allocation Size: 755.0 MB
- Deallocation Size: 352.4 MB
- Allocations: 129
- Total Thread Count: 1
- Paused Time: 0s
- Frame Count: 1

Memory Consumption

Elapsed Time: 41.384s

- Allocation Size: 1.2 GB
- Deallocation Size: 889.2 MB
- Allocations: 4,194,433
- Total Thread Count: 1
- Paused Time: 0s
- Frame Count: 3

Top Memory-Consuming Functions

This section lists the most memory-consuming functions in your application.

Function	Memory Consumption	Allocation/Deallocation Delta	Allocations	Mod
create_linked_list	469.8 MB	0.0 B	4,194,304	Link
create_data	402.7 MB	0.0 B	1	
create_array_data	352.3 MB	335.5 MB	7	
itt_init	40.3 KB	847.0 B	77	
[stack]	11.1 KB	11.0 KB	29	
[Others]	672.0 B	672.0 B	15	

*N/A is applied to non-summable metrics.

Top Tasks

This section lists the most active tasks in your application.

Task Type	Task Time	Task Count	Average Task Time
StructOfArray	7.041s	16	0.440s
LinkedList	6.979s	16	0.436s
ArrayOfStruct	6.930s	16	0.433s

*N/A is applied to non-summable metrics.

Actionable Insight

Reduce information on report to reduce cognitive overhead.

The less frequently a tool is used, the more intuitive it needs to be.

Recommendations are forthcoming.

- More exploration needed.

Welcome xResult x

Memory Consumption ⓘ ⓘ

Analysis ConfigurationCollection LogSummaryBottom-upPlatform

⌵ Elapsed Time ⓘ: 41.384s

Allocation Size: 1.2 GB
Deallocation Size: 889.2 MB
Allocations: 4,194,433
Total Thread Count: 1
Paused Time ⓘ: 0s
Frame Count: 3

⌵ Top Memory-Consuming Functions ⓘ

This section lists the most memory-consuming functions in your application.

Function	Memory Consumption	Allocation/Deallocation Delta	Allocations	Module
create_linked_list	469.8 MB	0.0 B	4,194,304	LinkedList_gcc ⓘ
create_data	402.7 MB	0.0 B	1	LinkedList_gcc ⓘ
create_array_data	352.3 MB	335.5 MB	7	LinkedList_gcc ⓘ
itt_init	40.3 KB	847.0 B	77	LinkedList_gcc ⓘ
[stack]	11.1 KB	11.0 KB	29	[stack]
[Others]	672.0 B	672.0 B	15	N/A*

*N/A is applied to non-summable metrics.

⌵ Top Tasks

This section lists the most active tasks in your application.

Task Type	Task Time ⓘ	Task Count ⓘ	Average Task Time ⓘ
StructOfArray	7.041s	16	0.440s
LinkedList	6.979s	16	0.436s
ArrayOfStruct	6.930s	16	0.433s

*N/A is applied to non-summable metrics.

Applicable Design Principles

80% of users rely on 20% of the features in any of an app

UX 80/20 VARIABLES

User Tasks
(% of tasks)

User Volume
(% of users)

Usage
(% of time)

X% of tasks Y% of users perform Z% of time

Questions

- Should we assume anything in VTune Server will be in the WTPK reports?
- Will SSH change to HTTPS? How does workflow/user flow change?
- ~~• Assignee in VASP Jira project?~~
- ~~• Do we already have existing WTPK stories in VASP?~~ (to inform what's being planned/what to expect?)
- Sporadic users and new users are outpacing VTune's expert-level users. Designing an intuitive experience with minimal support in a natively complex product is challenging; therefore, a consistent cadence of UX research is paramount to success. **[verify with Serap – where is this data?]**

UX/UI roadmap

Actionable Insight

Exploration Needed

- Way to model or preview results (like estimates) without having to rerun for each argument
- Enable automation for known mappings
- Make methods for bulk actions (bulk node registrations, tagging, etc.) -
 - Olga's comment: bulk actions are included in the redesign
- Security Concerns – (add slide)
- Provisional persona roles (devOps, admins, developers)

Timeline

July 2023

Big user study (usability testing of existing version of the product (5 tasks) + user interview; 12 sessions, 2 hour each).

August 2023

Analysis of user study results, presentation of results to the team, creation of JIRAs with highlights from user study.

September 2023

Onboarding of UI/UX and Visual designers; kickoff for user study insights conversion into prototypes and final designs, creation of UX/UI roadmap for Q4'23.

October 2023

Continue working closely with Engineering team, working on sprints.

November 2023

Work according to roadmap. Plan to establish a cadence of relatively quick user testing of interactive prototypes for validation and revealing real use cases with low granularity.

UX/UI roadmap Q3-Q4'23. Scenarios fully covered by user study

UI entity/flow/screens	Related JIRAs	UX analytics	Prototypes
	Created by Danielle	Status	Status
Getting started			
Log in page	Unmask password: WTPK-2025	Done	Done
Consent page		Done	Done
ToS page	Case of declining ToS: WTPK-2026	Done	Done
Tutorial	Tutorial: WTPK-2027	In progress	In progress
Register new nodes			
Register new node flow	Tagging within nodes registration flow: WTPK-2029 New nodes registration flow: WTPK-2033; Copy code: WTPK-2028	Done	Done
Launch analysis			
"Create analysis" screen/flow	Analysis form improvement: WTPK-2036 Validation within analysis form: WTPK-2038 Analysis templates list: WTPK-2034 Progress bar for analysis (implemented by WTPK team): WTPK-2032	In progress	To be planned
Compare results of analysis			
Navigation to results		To be planned	To be planned
Presentation of results		To be planned	To be planned
Comparison of results	Comparison of results: WTPK-2037	To be planned	To be planned
Aggregated view	Aggregated view: WTPK-2125	To be planned	To be planned
Share results of analysis			
Sharing results scenario & functionality		To be planned	To be planned

UX/UI roadmap Q3-Q4'23. Scenarios partially or not covered by user study

UI entity/flow/screens	Related JIRAs	UX analytics	Prototypes
	Created by Danielle	Status	Status
Tagging			
Tagging flow		Done	Done
Tag editor		Done	Done
Information architecture			
Main menu/Navigation	Navigation bar improvement: WTPK-2031	In progress	In progress
Multi-tenancy		In progress	In progress
Main page/dashboard	Dashboard: WTPK-2030	To be planned	To be planned
First time use flow		In progress	In progress
Tables (Nodes & Analyses)			
Registered nodes table	Bug with tagging from the Registered nodes table: WTPK-2035	Done	Done
Registered Node Detailed View		Done	Done
Analyses table Basic (Analysis Execution (AEs) table only; current functionality)	Ability to re-run analysis: WTPK-2060	Done	Done
Analyses table Advanced (AEs + Nodes Analysis Execution (NAEs) tables; flexible search capabilities)		Done	Done
Analysis Execution Detailed View		Done	Done
Node Analysis Execution Detailed View		Done	Done

Preparation of prototypes based on user study insights

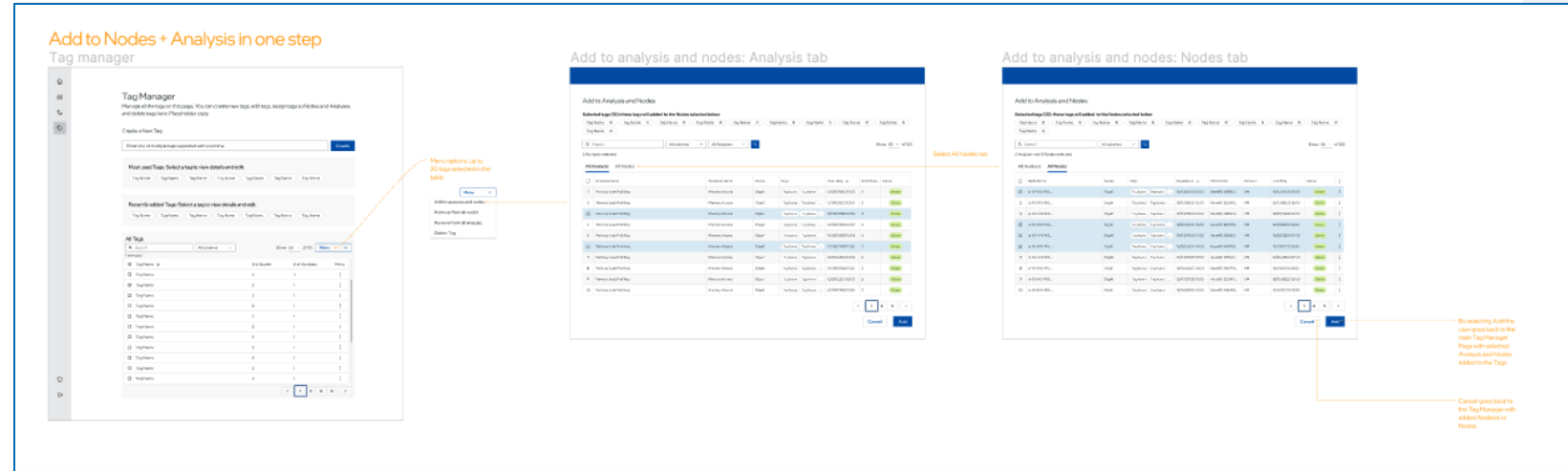
Inputs:

- UX analytics & Requirements from user testing
- Review of current implementation
- Product team requirements (including new features)

UX Goals:

- Enhance the user experience
- Streamline task completion
- Improve product functionality

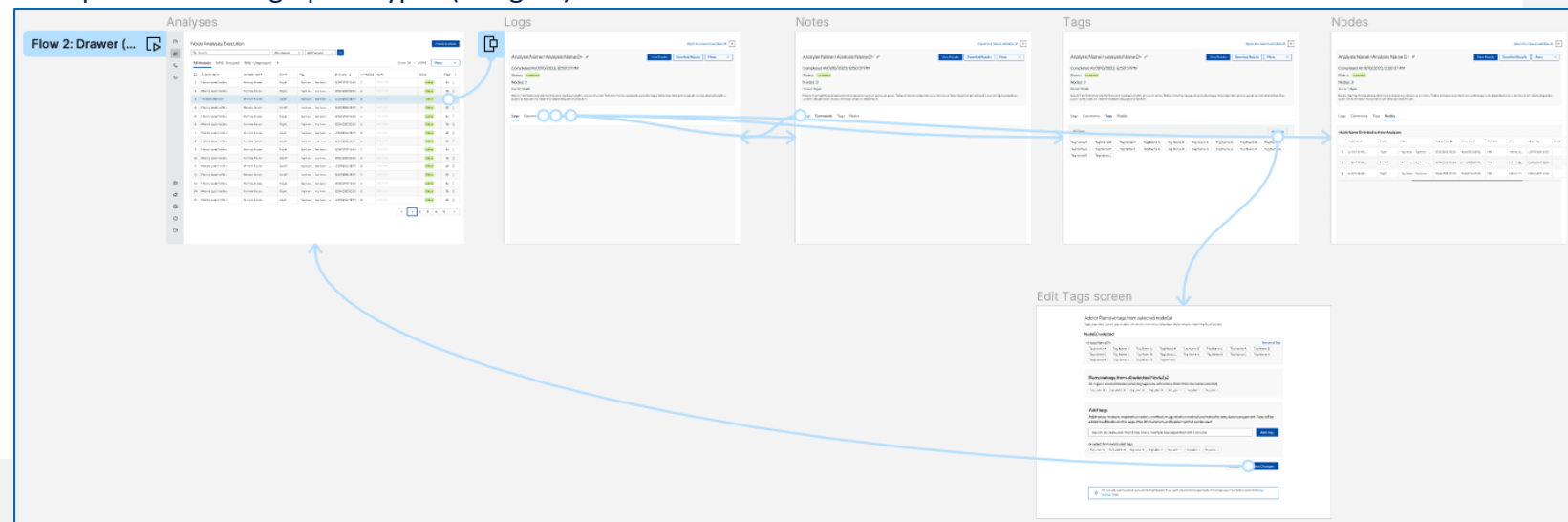
Example: New flows and feature mockups (in Figma)



Outputs:

- Mocking up new features, iterating and discussing functionality with the product team
- Design iterations in wireframes: UI details of features, flow and user experience
- Design prototypes: Quick tests to review flow and functionality
- Collaboration on visual design for final designs

Example: Click through prototypes (in Figma)



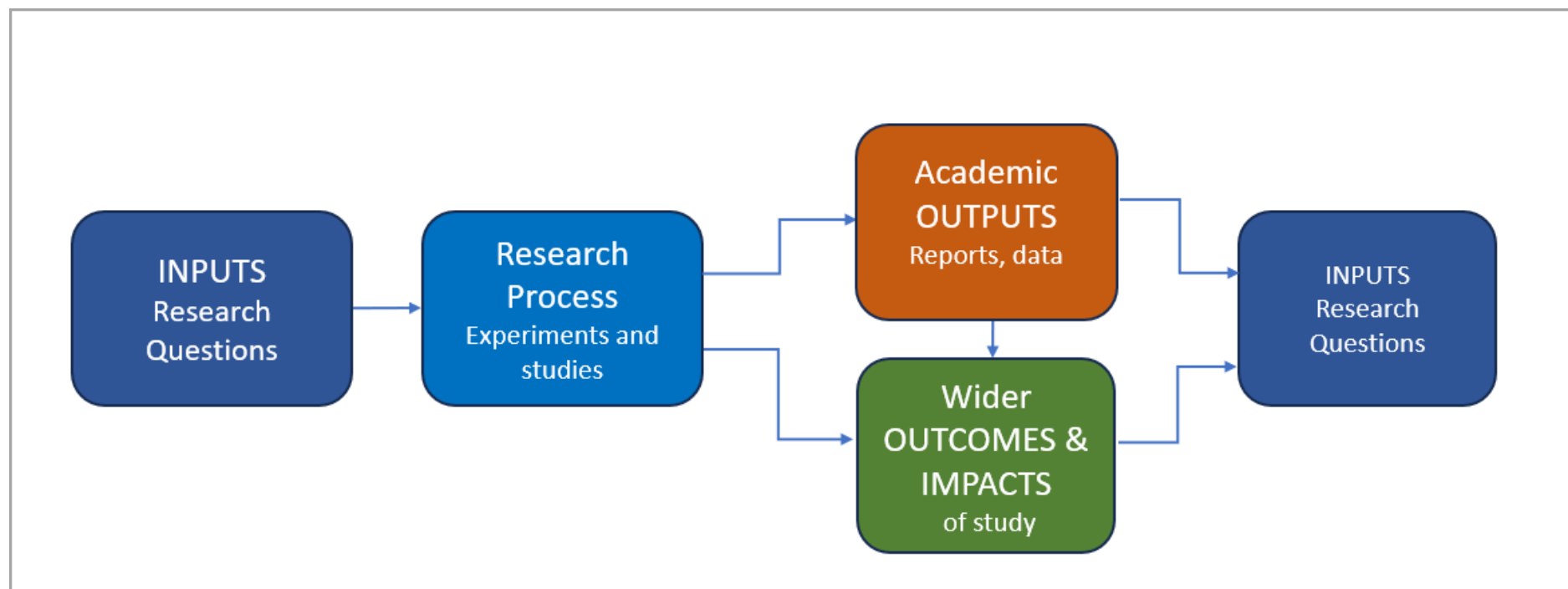
Reference Materials and Links

- [Link to WTPK Structure](#) (all Jira tickets resulting from the study)
- [Link to Dovetail project](#)
- [Link to video playlist](#)
- [Link to EDXA DX Jira Epic](#)



BACKUP

DX Research



Informative Insights **No Action Necessary**

Informative Insight

Secondary Research and Conclusions

- Sporadic users and new users are outpacing VTune's expert-level users. Designing an intuitive experience with minimal support in a natively complex product is challenging; therefore, a consistent cadence of UX research is paramount to success. **[verify with Serap – where is this data?]**
- Analyzers SaaS will live within an ecosystem of other tools. We should learn to accept and find ways to integrate with this ecosystem smoothly. [see tools mentioned slide]
- Many companies use custom tooling for profiling and optimizations in cloud environments, contributing to VTune SaaS being a unique cloud offering.

“I would say a simpler tool to use. Like when, when we have these proprietary tools when, and they, like, they don't have a good GUI and all those stuff, so it, it gets a little difficult. So in, in that aspect, it is good that it is providing all the, I like important values.” P4

“

”

Informative Insight

Tools Mentioned

- Log Stash
- Cloud Watch
- Data Dog
- Azure Monitor
- Grafana
- Dynatrace
- New Relic

Actionable Insight

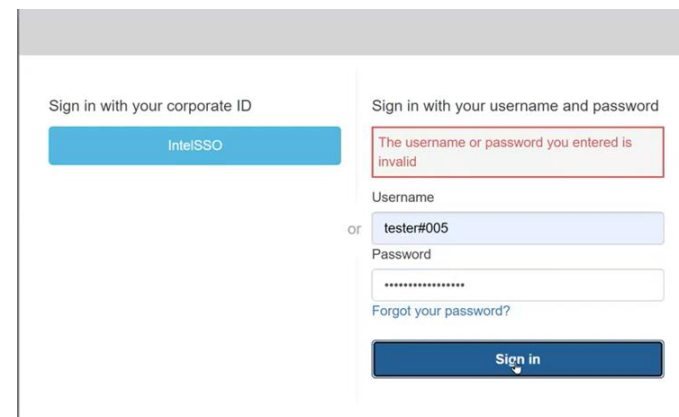
Getting started flow: Log in

Pain point: P5 had problems with logging in with provided credentials, but he couldn't check if password he entered was correct or not.

Recommendations:

Make password visible (unmask password).

Reference: Eye icon + text hint in Docker.



Sign in with your corporate ID

IntelSSO

Sign in with your username and password

The username or password you entered is invalid

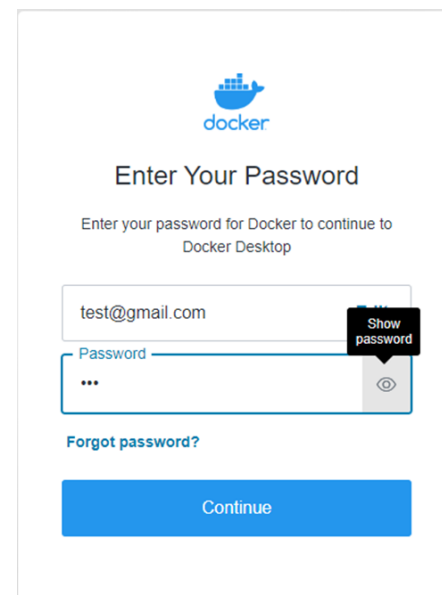
Username

or tester#005

Password

Forgot your password?

Sign in



docker

Enter Your Password

Enter your password for Docker to continue to Docker Desktop

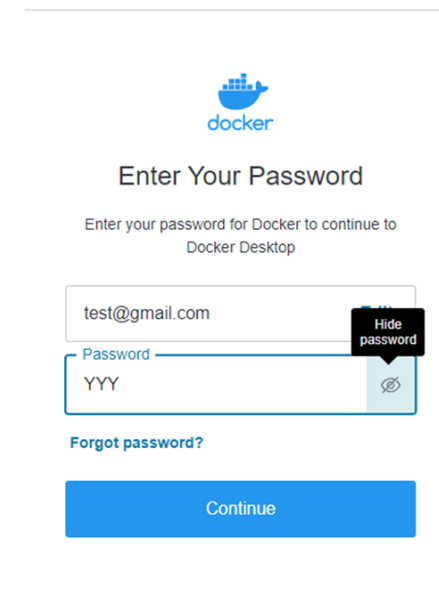
test@gmail.com

Password

...

Forgot password?

Continue



docker

Enter Your Password

Enter your password for Docker to continue to Docker Desktop

test@gmail.com

Password

YYY

Forgot password?

Continue

User Quotes – P6

No, not really. So, so think like **this** right now you set me a precedent saying that there are two hosts, they're running the same thing and one of them have a leak co find. So in **this** particular scenario, I see the behavior **and I** did what I did, but if there's a single host where I know something is wrong every 15 days, I need to restart the system, let's say. So I know there's a leak for sure. And **I**, at that point on, I don't really care **if** it's one node or two node. My focus is a given node. So I would okay. Draw my attention to that node. But my point being,

No, not really. So, so think like **this** right now you set me a precedent saying that there are two hosts, they're running the same thing and one of them have a leak co find. So in **this** particular scenario, I see the behavior **and I** did what I did, but if there's a single host where I know something is wrong every 15 days, I need to restart the system, let's say. So I know there's a leak for sure. And **I**, at that point on, I don't really care **if** it's one node or two node. My focus is a given node. So I would okay. Draw my attention to that node. But my point being,

User Quotes – P8

click on that one and then a sort of like drill in from there I'm definitely a visual person like chart that shows the sum would be valuable. And then, mentioned side by side in pairs that I'm probably gonna come ability to like select multiples combined dashboard is nice.

User Quotes – Pilot 1

Well then I'll just go back to the summary page. Okay.
Well let's see. This one's 4, 6, 9 0.8. They're about the same. Well if I look, if I just quickly look at the two tabs, we can see it says create array data. This number is different, right? So it looks like create array data is doing something weird with the memory on the second run here. And it's also why the, it's why I guess the allocation size and the de allocation size don't match.

User Quotes – # of nodes, methods of comparing

P8

with at a time? I mean, for the service I use now, you know, we, we deploy, we have like multiple clusters and environments. The most we have in any one cluster is 48. But like overall we have, you know, well over a hundred, I think almost 200 nodes total for one service. But I think I probably would still use this in the way that I, I used it now where it's like I said, very similar to like a **canary** where you, it's just a one in one, like a control and experiment that you're comparing. That's just like the nature of most problems. Like if a problem exists on one host, then it's probably gonna exist on all the hosts once the code is deployed equally.

Participant 4 - LD

Oh, I actually don't know that I would run this in parallel on different processes at the same time. Same because of the same thing I mentioned here. If I go to launch, so if I run on the same **node** on two different processes at the same time, I feel like that's gonna interfere with each other because I mean, I don't know, all profiling or debugging I've ever done is, you know, somewhat intensive on the computer. So I, I would wanna run them separately and then I would want to compare them, but there's also no way to look at, you know, like for this **node**, what, what jobs have I run? What analysis have I run for this **node** in the past? I kind of have to come here and

Pilot 1


max. It's hard to say the max, but the first thing I was thinking when I got two different results is that I probably wanted a third. So, right. It's like if you have two wrong clocks, how do you know which one is wrong? So it's hard to say the max, but 10 would definitely be hard to sift through the data, especially considering, you know, I guess if you had the feature where you could show the aggregate, it might be easier. But if I had to look at individual tabs, I'd say like five maybe is the max that I'd want to tabs that I'd wanna have open in my browser to like be comparing, you know, sections against

P1

It could be up to like 50 or, you know. Oh wow. Yeah. Yeah. I mean it, but they're all doing different things, so it's not like 50 supporting one single process. It'll be like 50 50, you know what I mean? Yeah.

Actionable Insight

View All Analysis table



Dashboard

Analysis

Launch

View All

Nodes

Register

View All

Feedback

User Guide

Security

All Analyses

Filter

Analysis Execution Name	Template Name	Start Date	# of Nodes	Status	
PerfSnapshot	PerformanceSnapshot	06/09/2023, 11:47:14 AM	2	COMPLETED	VIEW JOB
Memory leak check	MemoryConsumption	07/26/2023, 01:55:55 PM	2	COMPLETED	VIEW JOB
test1	MemoryConsumption	07/24/2023, 12:03:44 PM	2	COMPLETED	VIEW JOB
TestMemLeakProc	MemoryConsumption	07/21/2023, 02:46:39 PM	1	COMPLETED	VIEW JOB
TestMemLeak	MemoryConsumption	07/21/2023, 02:36:23 PM	1	FAILED	VIEW JOB
Memory Analysis 2	MemoryConsumption	07/21/2023, 11:57:30 AM	2	COMPLETED	VIEW JOB
Memory Analysis 1	MemoryAccess	07/21/2023, 11:52:02 AM	2	FAILED	VIEW JOB
Memory Leak Consumption	MemoryConsumption	07/20/2023, 04:57:16 PM	2	COMPLETED	VIEW JOB
Memory Leak Profiling	MemoryConsumption	07/20/2023, 01:50:03 PM	2	COMPLETED	VIEW JOB
testing ec2 vms for leaks	MemoryConsumption	07/19/2023, 06:12:39 PM	2	COMPLETED	VIEW JOB
sample_analysis	MemoryConsumption	07/18/2023, 06:10:42 PM	2	COMPLETED	VIEW JOB
20230717_test_performance	PerformanceSnapshot	07/17/2023, 01:44:46 PM	1	FAILED	VIEW JOB
MemoryConsumption2	MemoryConsumption	07/14/2023, 03:30:26 PM	1	COMPLETED	VIEW JOB
Memory Leaks	MemoryConsumption	07/14/2023, 03:04:33 PM	1	COMPLETED	VIEW JOB
Find Memory Leak Profiling Process	MemoryConsumption	07/12/2023, 05:08:57 PM	2	COMPLETED	VIEW JOB

Recommendations: