Intel® AI Edge System Qualification

Get Started Guide

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System Requirements

Before starting, ensure your system meets the following Edge AI performance swimlanes requirement:

Hardware

Intel® ESQ supports a wide range of Intel® edge systems optimized for various performance and use case requirements.

For ESQ Qualification, we only accept 2025-2026 launched CPU products.

Edge AI Performance Swimlane	CPU	Memory (Min)	Storage (Min)	Discrete GPU Pairing
Scalable Performance	Intel® Xeon® 6 & Xeon 5 processors	256GB	1 TB	-
Scalable Performance Graphics & Media	Intel® Core™ Series 2 or Core Ultra Series 2 with Intel® ARC™ B Series	64 GB	512 GB	Intel® ARC™ B Series
Efficiency Optimized AI	Intel® Core™ Ultra processor Series 2 or Series 3	32 GB	512 GB	-
Mainstream	Intel® Core™ Series 2	32 GB	256 GB	-
Entry	Intel® Processor for Desktop Intel® Processor X-series Intel® Processor N-series	16 GB	256 GB	-

Operating System

ESQ software supports the following operating systems:

OS	Version	Notes
Ubuntu*	24.04 Desktop LTS with kernel v6.14 and newer	Recommended
Ubuntu*	24.04 Server LTS with kernel v6.14 and newer	Supported only for server/Xeon Platforms
Windows*	11	Not Supported

System Dependencies

Install the following dependencies before initiating system qualifications.

System Drivers

Configure system drivers:

```
sudo bash -c "$(wget -qLO -
https://raw.githubusercontent.com/intel/edge-developer-kit-
reference-scripts/refs/heads/main/main_installer.sh)"
```

ESQ Runtime Dependencies

Install essential system packages:

```
sudo apt update && sudo apt install -y curl git
```

Docker Engine

Install Docker* Engine:

```
# Add Docker's official GPG key

sudo apt-get update

sudo apt-get install ca-certificates curl

sudo install -m 0755 -d /etc/apt/keyrings

sudo curl -fsSL https://download.docker.com/linux/ubuntu/gpg -o
/etc/apt/keyrings/docker.asc

sudo chmod a+r /etc/apt/keyrings/docker.asc
```

Add the repository to APT sources

```
echo \

  "deb [arch=$(dpkg --print-architecture) signed-
by=/etc/apt/keyrings/docker.asc]
https://download.docker.com/linux/ubuntu \

  $(. /etc/os-release && echo "$VERSION_CODENAME") stable" | \

  sudo tee /etc/apt/sources.list.d/docker.list > /dev/null

sudo apt-get update
```

Install Docker packages

```
sudo apt-get install docker-ce docker-ce-cli containerd.io docker-buildx-plugin docker-compose-plugin
```

Add your user to the docker group:

Warning : Adding your user to the docker group grants root-level access. This recommendation applies only to development or testing environments.

```
sudo usermod -aG docker $USER
```

To activate your new group membership immediately in your current terminal, run:

```
newgrp docker
```

This command starts a new shell session with updated group permissions, allowing you to use Docker* without logging out. You can now verify Docker* installation:

```
docker ps
```

Note: If you see a container list, even if it's empty, this indicates the user has been added to the docker group successfully. If you get a permission error, issue **newgrp docker** command in terminal. For changes to take effect, log out and login, or reboot your system.

Python Package Manager

Install uv to accelerate Python* package management:

```
curl -LsSf https://astral.sh/uv/install.sh | sh && source $HOME/.local/bin/env
```

Install Intel® ESQ from GitHub*:

```
uv tool install --force --refresh git+https://github.com/open-edge-platform/edge-system-qualification.git@main
```

Verify that ESQ.

```
esq --version
```

Enabling Power Monitoring Feature

Running Average Power Limit (RAPL) provides us energy consumption data from Intel processors. To allow Intel® ESQ to collect power configuration information without requiring root privileges, please configure non-root access to RAPL (Running Average Power Limit) powercap files for platform power monitoring

Run the automated setup script to configure group-based permissions:

```
sudo bash -c "$(wget -qLO - https://raw.githubusercontent.com/open-edge-platform/edge-system-qualification/refs/heads/main/scripts/setup-powercap-permissions.sh)"
```

```
$ sudo bash -c "$(wget -qLO - https://raw.githubusercontent.com/open-edge-platform/edge-system-qualification/refs/heads/main/scripts/setup-powercap-permissions.sh)"
=== Platform Power Monitoring Setup ===

[1/3] Checking group 'powercap'...
 ✓ Group 'powercap' already exists
[2/3] Checking user 'user' group membership...
 Adding user 'user' to group 'powercap'...
 ✓ User added to group
[3/3] Detecting powercap files and configuring permissions...
 Detected 3 powercap energy files
 ✓ Configuration written to /etc/sysfs.d/powercap.conf
 ✓ Permissions applied to current session

=== Setup Complete ===

✓ Setup complete - group membership configured

IMPORTANT: Your current shell session needs group activation
 (User was just added to 'powercap' group)

Choose one option to activate:

 Option 1 - New shell with group active (RECOMMENDED):
  newgrp powercap
  # This starts a new shell with the group loaded
  # Type 'exit' when done to return to original shell

 Option 2 - Logout and login again (or reboot)

After activation, verify access:
 cat /sys/class/powercap/intel-rapl/intel-rapl:0/energy_uj
```

Qualification

Clean Qualification Environment

Please run the following command to clean up previously created "esq_data" folder. This ensures that leftover data from previous ESQ versions does not interfere with the new installation.

```
esq clean --all
```

If "esq_data" folder still exists after ESQ uninstallation, remove it using the command above. This is crucial to avoid any conflicting issues during new ESQ runtime.

Start Qualification

To initiate system qualification for AI Edge Systems, run the command **esq run**

```
esq run
```

By default, esq software will run the following

- AI Edge Systems Qualification (mandatory for qualification and marketing benefits).
- Vertical Use-Case Proxy Workload and Analysis, (required for vertical positioning in Intel Edge AI Catalog)
- Horizontal Workloads analysis : GPU Frequency , Memory, and other performance parameters.

```
$ esq run
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Default: Run qualification and vertical profiles
Option:  Run qualification profiles only (skip vertical profiles)
Tip: Use --all flag to perform full system performance benchmarking

Vertical profiles:
 - profile.vertical.manufacturing
 - profile.vertical.metro
 - profile.vertical.retail
```
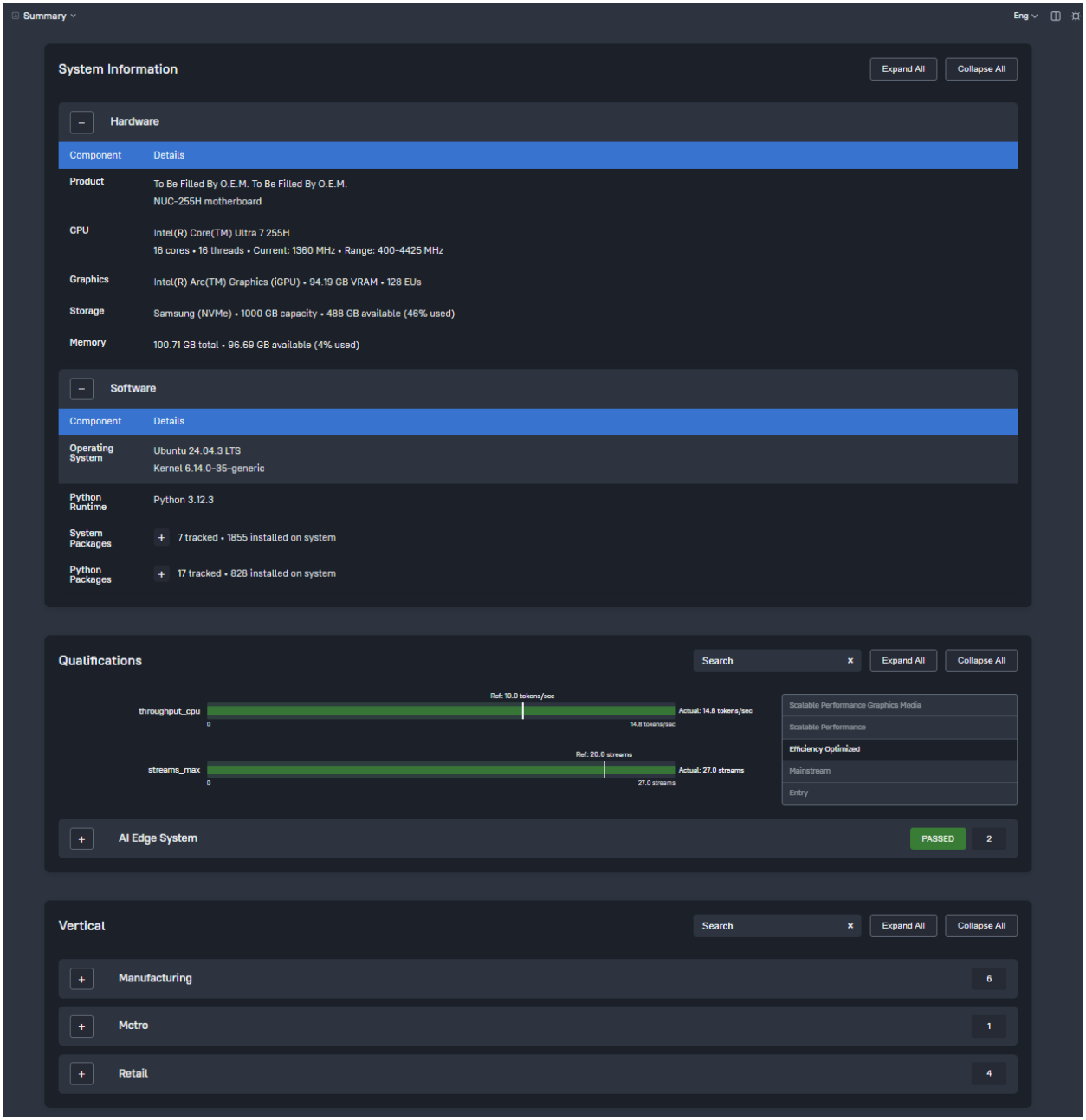
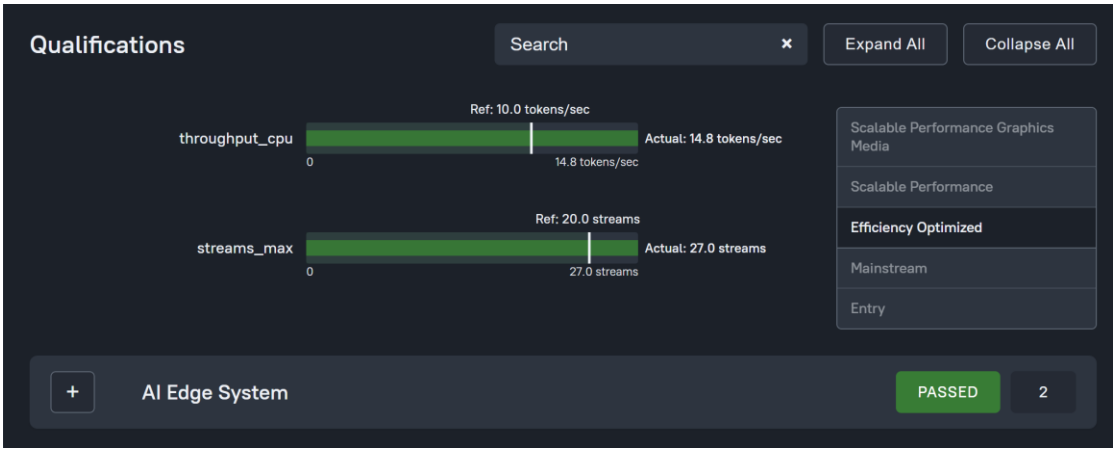

Qualification Results

When ESQ test is completed successfully, a report is generated with sections like system summary, qualification status and individual vertical use-case benchmarking. Each section can be expanded to find details, test parameters and errors making it easy to spot both successful areas and those needing further analysis.



Qualification Submission Criteria

For AI Edge System Benefit and Catalog inclusion eligibility, you must submit a test report that passes the AI Edge System qualification as shown below. The report should clearly indicate successful qualification status, with all mandatory test profiles completed and no critical errors present. Make sure to include all required sections, such as the system summary, qualification status, and detailed benchmarking results, to ensure your submission meets the evaluation criteria.



To submit go to : https://builders.intel.com/ecosystem-engagement/solution-hub/systems/qualification-form or intel.edge.ai.systems@intel.com

Should your system be impacted by performance or benchmarking issues, proceed to contact support via Intel Premier Support

Support

Support is available for Intel partners via Intel Premier Support
For correct case disposition, please select the following products and categories.

- Product “Intel® Edge Software Recipes”
- Category as “Software/Driver/OS”
- Sub-Category as “Intel® Edge System Qualification”

Additional Reference

Drivers and Scripts

For detailed information about system drivers, see the Edge Developer Kit Reference Scripts documentation.

Proxy Setup

If you are working in an Intel network environment, your target system needs the following setup.

System Proxy

Verify system proxies have been correctly configured.

```
$ cat /etc/environment
```

To update, simply use vi or vim command to add the following proxy.

```
http_proxy="http://proxy.example.com:3128"
https_proxy="http://proxy.example.com:3128"
no_proxy="localhost,127.0.0.1, 127.0.0.0/8”
HTTP_PROXY="http://proxy.example.com:3128"
HTTPS_PROXY="http://proxy.example.com:3128"
NO_PROXY="localhost,127.0.0.1, 127.0.0.0/8"
```

Docker Proxy

This file is a "drop-in" configuration that allows you to add or override settings for the docker.service without directly modifying the main service file, a standard method for configuring the Docker daemon to work within a network that uses an explicit proxy.

1. **Edit docker service proxy setting file:**

```
sudo vi /etc/systemd/system/docker.service.d/http-proxy.conf
```

2. **Add Docker Daemon Proxy Settings:** Replace the example URLs with your proxy details and save.

```
[Service]
Environment="HTTP_PROXY=http://proxy.example.com:8080/"
Environment="HTTPS_PROXY=http://proxy.example.com:8080/"
Environment="NO_PROXY=localhost,127.0.0.1,docker-registry.local,10.0.0.0/8"
```

3. **Update Docker Client Proxy Configurations:** Create ~/.docker folder and create config.json file.

```
mkdir -p ~/.docker
vi ~/.docker/config.json
```

Add details to as below into **config.json** and save file.

```
{
 "proxies": {
  "default": {
   "httpProxy": "http://proxy-dmz.intel.com:912",
   "httpsProxy": "http://proxy-dmz.intel.com:912",
   "noProxy": "localhost,127.0.0.0/8,127.0.0.1,172.17.0.1"
  }
 }
}
```

4. **Reload systemd and restart Docker:**
After saving the file, reload the systemd and client configuration to read the new drop-in file and restart the Docker service for the changes to take effect.

```
sudo systemctl daemon-reload
sudo systemctl restart docker
```

Driver Requirements

Intel® GPU and NPU tests require specific drivers. Ensure you have the latest Intel® drivers installed for your hardware configuration.

Virtualization

Running virtual machines may impact performance and hardware acceleration capabilities. For dependable outcomes, it is advisable to use a bare metal installation.

Documentation and Reference

I. Official UV documentation.
II. Official Docker* Engine installation documentation.

Skipping Vertical Benchmarking

You can run qualification option only by using the verbose option by using the command below,

```
$ esq -v run
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Default: Run qualification and vertical profiles
Option:  Run qualification profiles only (skip vertical profiles)
Tip: Use --all flag to perform full system performance benchmarking

Vertical profiles:
 - profile.vertical.manufacturing
 - profile.vertical.metro
 - profile.vertical.retail
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Skip vertical profiles? [N/y or press Enter for default]: Y
```