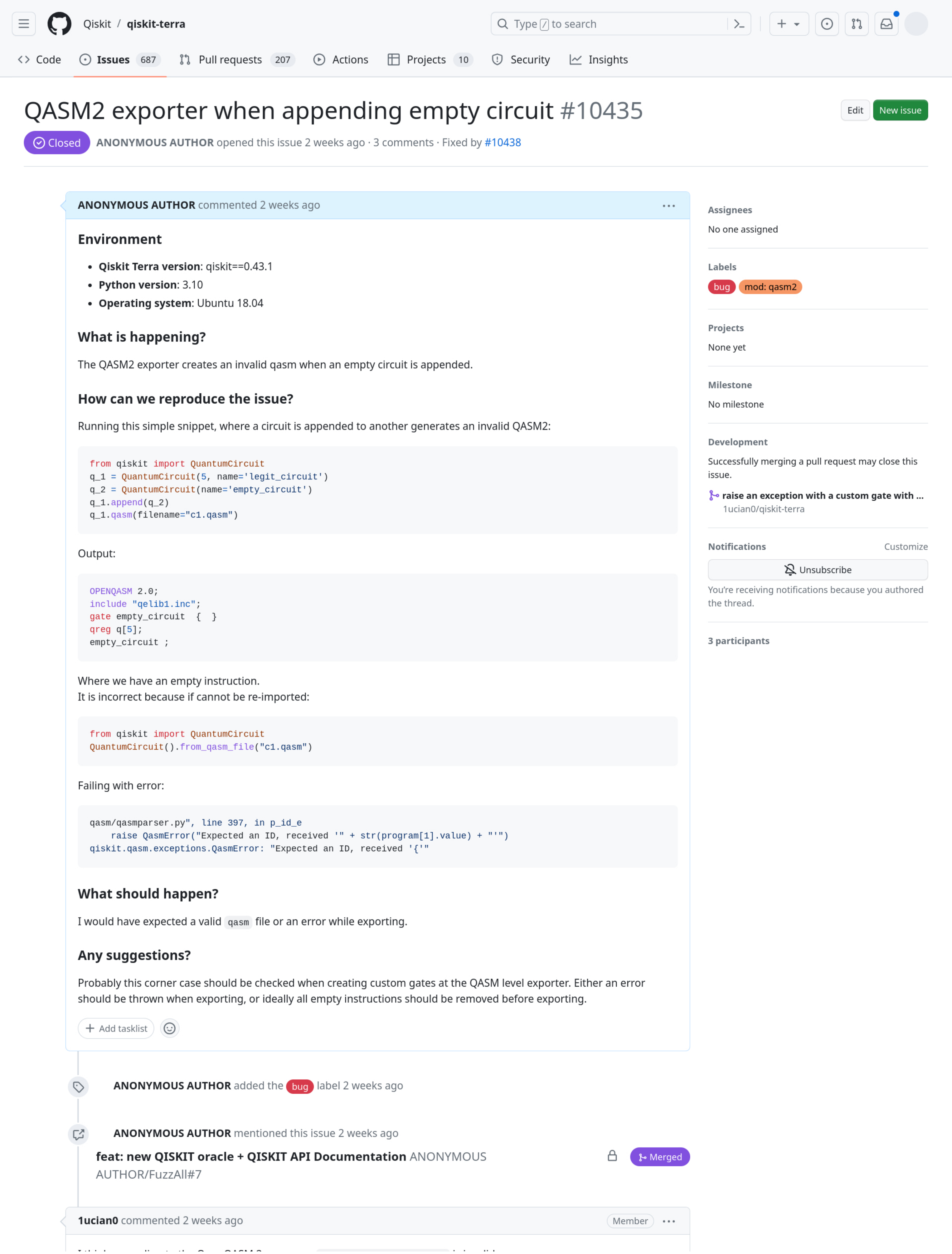

QASM2 exporter when appending empty circuit #10435

Closed **ANONYMOUS AUTHOR** opened this issue 2 weeks ago · 3 comments · Fixed by #10438

ANONYMOUS AUTHOR commented 2 weeks ago

Environment

- **Qiskit Terra version**: qiskit==0.43.1
- **Python version**: 3.10
- **Operating system**: Ubuntu 18.04

What is happening?

The QASM2 exporter creates an invalid qasm when an empty circuit is appended.

How can we reproduce the issue?

Running this simple snippet, where a circuit is appended to another generates an invalid QASM2:

```
from qiskit import QuantumCircuit
q_1 = QuantumCircuit(5, name='legit_circuit')
q_2 = QuantumCircuit(name='empty_circuit')
q_1.append(q_2)
q_1.qasm(filename="c1.qasm")
```

Output:

```
OPENQASM 2.0;
include "qelib1.inc";
gate empty_circuit  {  }
qreg q[5];
empty_circuit ;
```

Where we have an empty instruction.
It is incorrect because if cannot be re-imported:

```
from qiskit import QuantumCircuit
QuantumCircuit().from_qasm_file("c1.qasm")
```

Failing with error:

```
qasm/qasmparser.py", line 397, in p_id_e
    raise QasmError("Expected an ID, received '" + str(program[1].value) + "'")
qiskit.qasm.exceptions.QasmError: "Expected an ID, received '{'"
```

What should happen?

I would have expected a valid `qasm` file or an error while exporting.

Any suggestions?

Probably this corner case should be checked when creating custom gates at the QASM level exporter. Either an error should be thrown when exporting, or ideally all empty instructions should be removed before exporting.

ANONYMOUS AUTHOR added the bug label 2 weeks ago

ANONYMOUS AUTHOR mentioned this issue 2 weeks ago

feat: new QISKIT oracle + QISKIT API Documentation ANONYMOUS AUTHOR/FuzzAll#7 Merged

1ucian0 commented 2 weeks ago Member

Assignees

No one assigned

Labels

bug mod: qasm2

Projects

None yet

Milestone

No milestone

Development

Successfully merging a pull request may close this issue.

raise an exception with a custom gate with ...
1ucian0/qiskit-terra

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3 participants

I think, according to the OpenQASM 2 grammar, `gate empty_circuit { }` is invalid.

I'm actually surprised that `QuantumCircuit(name='empty_circuit')` is valid :-/

1ucian0 commented 2 weeks ago Member

Other non-valid OpenQASM2 exports:

```
from qiskit import QuantumCircuit
q_1 = QuantumCircuit(5, 1, name='legit_circuit')
q_2 = QuantumCircuit(1, name='with_classical_wire')
q_2.measure_all()
q_1.append(q_2, [0], [0])
print(q_1.qasm())
```

```
OPENQASM 2.0;
include "qelib1.inc";
gate with_classical_wire q0 { barrier q0; measure q0; }
qreg q[5];
creg c[1];
with_classical_wire q[0],c[0];
```

1ucian0 added the mod: qasm2 label 2 weeks ago

1ucian0 mentioned this issue 2 weeks ago

raise an exception with a custom gate with clbits or no qubits #10438 Merged

jakelishman commented 2 weeks ago Member

Luciano: that second example is already a total lost cause in the OQ2 exporter - unknown `Instruction` instances shouldn't be permitted to be exported whether or not they've got classical bits, because an `Instruction` that is not a `Gate` is explicitly saying "you can't rely on me being unitary". However, I'm fairly sure there are places using OQ2 exports that play loosely with `to_instruction` vs `to_gate`, so at this point it's unlikely to be worth trying to walk that back.

Erroring out when there's a clbit in the `Instruction` is fine, though, as is erroring out if there's no qubits. Note that there *are* valid 0q unitary operations (advancing the global phase), but they're not representable in OQ2, which requires all `gate` declarations and uses to involve at least one qubit.

jakelishman closed this as completed in #10438 last week

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