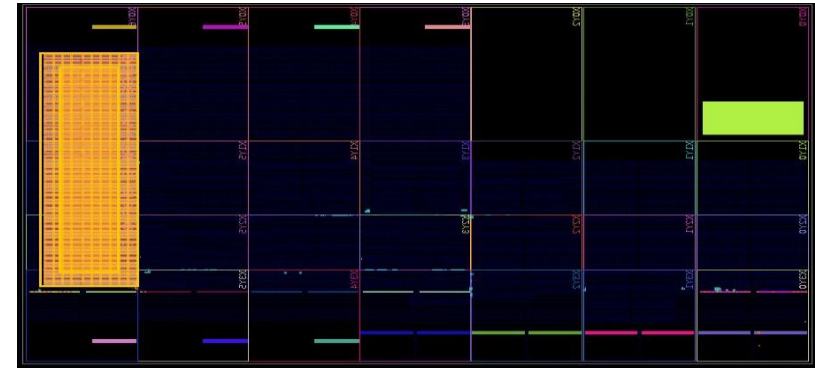
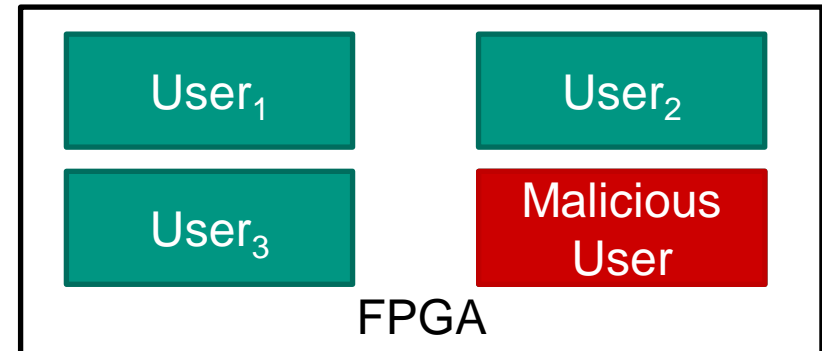


Multi-Tenant FPGAs

- Recent FPGAs have enormous amount of resources available
- Normal cloud-user does not need all available resources
 - Multi-tenant: partition the resources between different users
- Problem: One user can be malicious and harm other tenants, e.g.
 - Crash FPGA
 - Inject timing faults



Implementation of 10 JPEG compression & decompression instances on ZCU102 (Area needed in yellow box)



Our Solution: LoopBreaker

- Have a reconfiguration manager on the FPGA
 - Achieves fast reconfiguration for the malicious tenant
- Easy solution: 'Blanking', i.e., reconfigure the entire malicious region
 - Too slow to prevent crash
- **Our solution:** Custom made partial bitstreams
 - Only **disables interconnects** thus breaking the loop
 - **Extremely fast**
 - **Easier said than done**
 - Requires reverse engineering

