# Azure Functions: Restrictions and Limitations

Azure Functions is a serverless compute service that enables you to run event-driven code without managing infrastructure. However, like all services, it comes with certain limitations and restrictions. Understanding these will help you design and deploy your applications more effectively.

**1. Execution Time and Memory Limits**

* **Consumption Plan:**
  + Maximum execution time is **5 minutes** (default). This can be extended up to **60 minutes** with configuration.
  + Memory allocated ranges from **128 MB** to **1.5 GB** per function instance.
* **Premium and Dedicated Plans:**
  + Execution timeout is configurable, allowing for indefinite execution.
  + Memory can be scaled up to **14 GB** per instance.

**2. Triggers and Bindings**

* **Storage Account Dependencies:** Some triggers (e.g., Blob and Queue storage) require an active Azure Storage account.
* **Concurrent Execution Limits:** The maximum number of concurrent function executions is constrained by the plan type and the function's code implementation.

**3. Resource Consumption Limits**

* **CPU and Memory Usage:** On the Consumption plan, the CPU and memory allocated are shared across all function instances running on the same function app.
* **Function Timeout:** Functions in the Consumption plan have a fixed timeout of up to **5 minutes** by default, extendable to **60 minutes**.
* **Dynamic Scaling:** Functions automatically scale out based on demand. However, scaling limits depend on the plan:
  + **Consumption Plan:** Maximum of 200 instances.
  + **Premium Plan:** No instance limit, but it is subject to regional resource availability.

**4. Storage and File System Access**

* **Read-Only File System:** On the Consumption plan, the file system is read-only. Writing to the file system is not possible, except for temporary files in the /tmp directory (limited to 500 MB).
* **Persistent Storage:** Functions must use external storage solutions (e.g., Azure Blob Storage) for persistent file storage.

**5. Network Connectivity**

* **VNET Integration:** Functions can integrate with a Virtual Network (VNET) to securely access resources. However, this is only available in the Premium and Dedicated plans.
* **Outbound IP Addresses:** Functions on the Consumption plan share outbound IP addresses, which may change dynamically.

**6. Cold Start**

* On the Consumption plan, functions experience "cold starts" when triggered after a period of inactivity. This can introduce latency in processing the first request.
* The Premium and Dedicated plans reduce cold start delays since functions are pre-warmed.

**7. Security Restrictions**

* **Networking:** Functions on the Consumption plan cannot directly access resources behind a VNET without configuring private endpoints or using VNET integration (available in Premium/Dedicated plans).
* **Authentication:** Managed identity and Azure Active Directory (AAD) integration are available, but they require additional setup and permissions.

**8. HTTP Trigger Limitations**

* **Payload Size:** Maximum request size is limited to **100 MB** for HTTP triggers.
* **Concurrent Requests:** There is a limit on the number of concurrent HTTP connections in the Consumption plan. This limit depends on the region and is subject to change.

**9. Service Quotas**

* **Function App Limits:** Each function app can contain up to **200** functions.
* **Maximum Number of Apps:** There is a limit to the number of function apps per region per subscription. This limit varies by region and subscription type.

**10. Deployment and Update Limits**

* **Warm Starts:** Deploying or updating a function app may cause a warm start, temporarily impacting performance.
* **Deployment Slots:** Available only in Premium and Dedicated plans, deployment slots allow for staging deployments, but there is a limit on the number of slots based on the plan.