# TTP Detail – T1168

## TTP Information

Name: Local Job Scheduling

Description: On Linux and macOS systems, multiple methods are supported for creating pre-scheduled and periodic background jobs: cron, (Citation: Die.net Linux crontab Man Page) at, (Citation: Die.net Linux at Man Page) and launchd. (Citation: AppleDocs Scheduling Timed Jobs) Unlike [Scheduled Task/Job](https://attack.mitre.org/techniques/T1053) on Windows systems, job scheduling on Linux-based systems cannot be done remotely unless used in conjunction within an established remote session, like secure shell (SSH).  
  
### cron  
  
System-wide cron jobs are installed by modifying <code>/etc/crontab</code> file, <code>/etc/cron.d/</code> directory or other locations supported by the Cron daemon, while per-user cron jobs are installed using crontab with specifically formatted crontab files. (Citation: AppleDocs Scheduling Timed Jobs) This works on macOS and Linux systems.  
  
Those methods allow for commands or scripts to be executed at specific, periodic intervals in the background without user interaction. An adversary may use job scheduling to execute programs at system startup or on a scheduled basis for Persistence, (Citation: Janicab) (Citation: Methods of Mac Malware Persistence) (Citation: Malware Persistence on OS X) (Citation: Avast Linux Trojan Cron Persistence) to conduct Execution as part of Lateral Movement, to gain root privileges, or to run a process under the context of a specific account.  
  
### at  
  
The at program is another means on POSIX-based systems, including macOS and Linux, to schedule a program or script job for execution at a later date and/or time, which could also be used for the same purposes.  
  
### launchd  
  
Each launchd job is described by a different configuration property list (plist) file similar to [Launch Daemon](https://attack.mitre.org/techniques/T1160) or [Launch Agent](https://attack.mitre.org/techniques/T1159), except there is an additional key called <code>StartCalendarInterval</code> with a dictionary of time values. (Citation: AppleDocs Scheduling Timed Jobs) This only works on macOS and OS X.

## Threat-Mapped Scoring

Score: 1.8

Priority: P4 - Informational (Low)

## Kill Chain Phases

**•** mitre-attack: persistence

**•** mitre-attack: execution