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Title of the Invention

Update Manager Module for an Enhanced Method for Updating an Operating System

Description of the Invention

An Update Manager module is created within the Operating System that streamlines updates by comparing the existing OS to the OS update and downloading only the applicable changes.

Problem or Opportunity

Downloading an update package can create problems for users due to the bandwidth of network transmission and the size of software applications. In some cases, only a portion of the update package is needed. This can lead to downloading redundant data, causing longer update times.

Furthermore, the update process requires the OS to make a "shadow" copy of itself and store it locally. Should the update then fail, the shadowed OS would then reinstall and the failed update would be removed. The process for reinstalling the original OS could be lengthy and frustrating. A need exists for an increasingly efficient means for updating an operating system.

Detailed Description of the Invention

Streamlining the update process by only retrieving necessary updates can be facilitated by an Update Manager module. The system consists of an OS with an Update Manager. When a new update becomes available, the Update Manager compares the current installation of the OS to the update. The Update Manager then notes the differences and only downloads and incorporates the segments of the new code that differ from the original code. This requires the coding of the software to take advantage of this novel technique, that is, the software must be designed to allow for this modular update process. Similarly to the current situation, a shadow copy of the segments being updated will be created in the event the update fails. Ultimately, the Update Manager reduces the size of downloadable updates and the time required for installation.
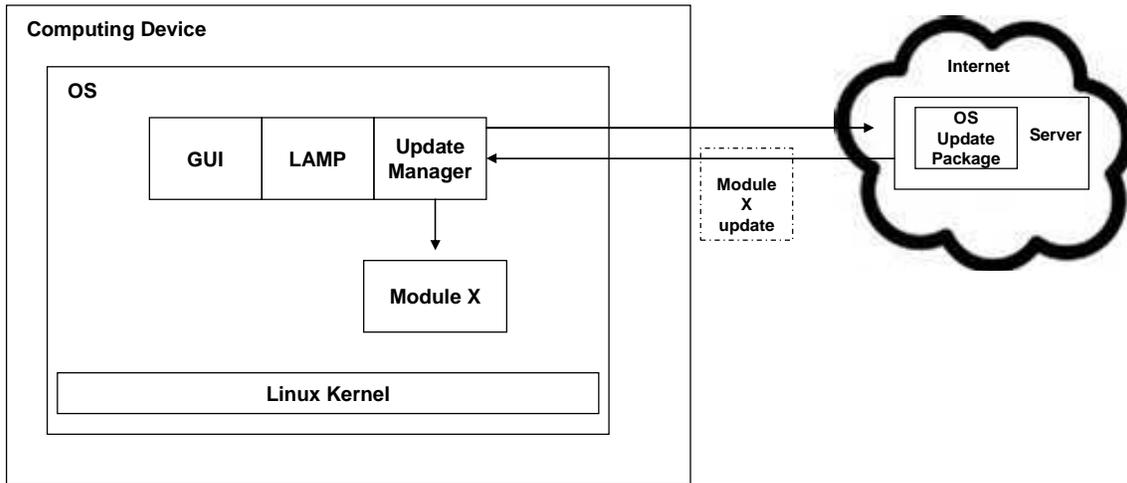
Figure 1: System for Upgrading Operating System

Description of Figure 1 Elements

Operating System (OS): This is the operating system (i.e. Linux) as is exists prior to any update activity. The different boxes inside the OS represent different OS elements.

OS Update Package: This is the full version of the operating system update. The update package is designed to update all of the OS elements.

Update Manager: This notes the differences between the current OS and Updated OS and only downloads and incorporates the segments of the new code that differ from the original code. The Update Manager also makes a shadow copy of the segments of original code that are being updated in case the update fails and the original code must be reinstalled

Module X: An example of one OS element that needs to be updated rather than the entire OS being updated.

Module X Update: This piece of code is extracted from the OS Update Package by the Update Manager and then installed on the OS.

The method for updating elements of an operating system using an Update Manager begins when an OS Update Package becomes available (**Figure 2**)**.**

In step 1, the Update Manager is notified by a user or remote server that an OS Update Package is available on a specific server.

In step 2, the Update Manager analyzes the update to determine which element(s) of the OS need to be updated.

In step 3, the Update Manager extracts only the element(s) of the OS Update Package that is needed by the OS.

In step 4, the Update Manager makes a shadow copy of the elements of the OS that are to be updated. In case the update fails, this shadow copy will be used to reinstall these elements of the OS.

In step 5, the Update Manager initiates the installation of selected elements of the OS Update Package.

In decision step 6, the Update Manager determines if the installation has been successful. If yes, the method continues with step 7. If not, the method proceeds to step 8.

In step 7, the shadow copy is discarded and the updated OS is rendered operational.

In step 8, the shadow copy is reinstalled and the original OS is rendered operational.

The method ends.

```
                    ┌──────────┐
                    │  Start   │
                    └──────────┘
                         │
                         ▼
┌──────────────────────────┐       ┌──────────────────────────┐
│ Step 1: The Update        │       │ Step 5: The Update Manager │
│ Manager is notified by a  │       │ initiates the installation │
│ user or remote server     │       │ of selected elements of   │
│ that an OS Update Package │       │ the OS Update Package.    │
│ is available on a         │       └──────────────────────────┘
│ specific server.          │                  │
└──────────────────────────┘                  ▼
              │                      ◇ Decision Step 6:      No ──────┐
              ▼                        Is the installation            │
┌──────────────────────────┐           successful?                   │
│ Step 2: The Update        │                  │ Yes                  ▼
│ Manager analyzes the      │                  ▼            ┌──────────────────────┐
│ update to determine which │       ┌──────────────────┐   │ Step 8: the shadow   │
│ element(s) of the OS need │       │ Step 7: The      │   │ copy is reinstalled  │
│ to be updated.            │       │ shadow copy is   │   │ and the original OS  │
└──────────────────────────┘       │ discarded and    │   │ is rendered          │
              │                      │ the updated OS   │   │ operational.         │
              ▼                      │ is rendered      │   └──────────────────────┘
┌──────────────────────────┐       │ operational.     │
│ Step 3: The Update        │       └──────────────────┘
│ Manager extracts only the │                  │
│ element(s) of the OS      │                  ▼
│ Update Package that is    │              ┌────────┐
│ needed by the OS.         │              │  Ends  │
└──────────────────────────┘              └────────┘
              │
              ▼
┌──────────────────────────┐
│ Step 4: The Update        │
│ Manager makes a shadow    │
│ copy of the elements of   │
│ the OS that are to be     │
│ updated. In case the      │
│ update fails, this shadow │
│ copy will be used to      │
│ reinstall these elements  │
│ of the OS.                │
└──────────────────────────┘
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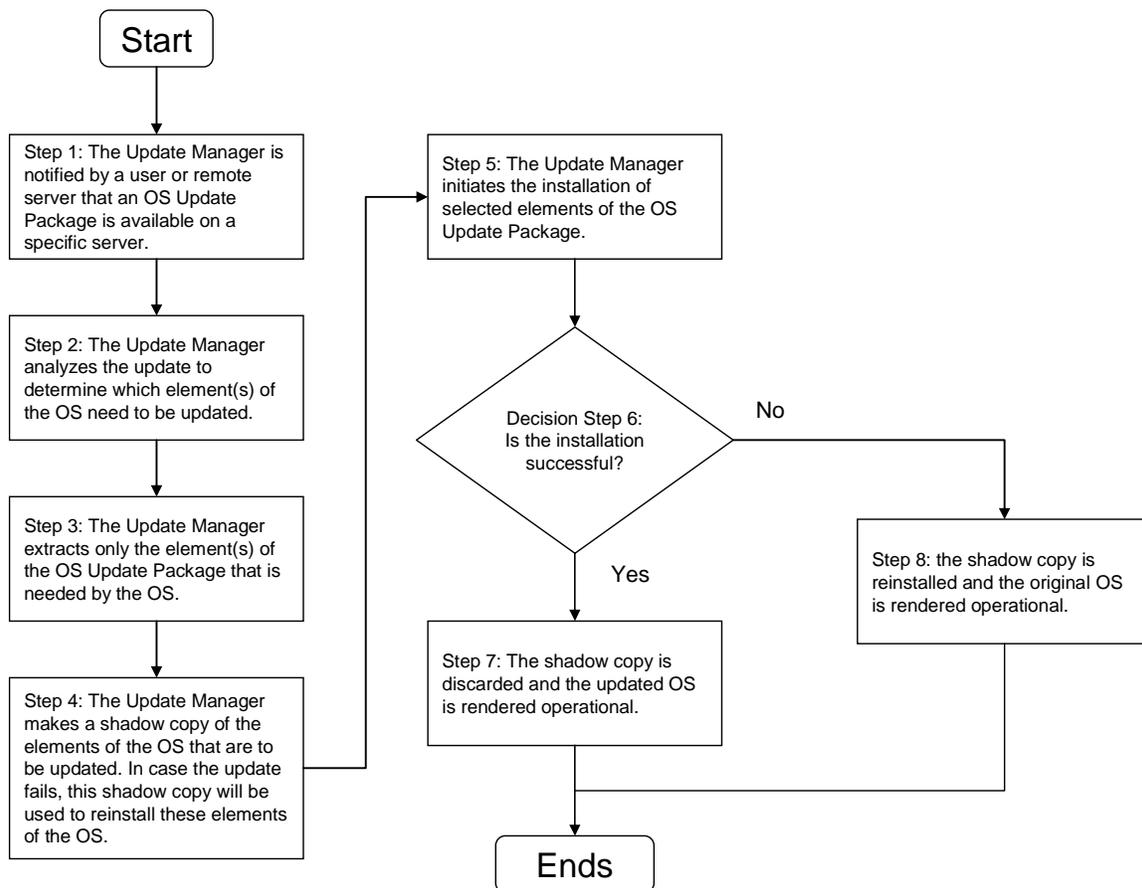
Figure 2: A flowchart of using an Update Manager to more efficiently update an operating system.