Apex Support Bulletin: Delta Updates for Office 2016 for Mac

Summary

Updates for Office 2016 for Mac are released on a monthly basis. Up until now, each monthly update contained a complete full copy of the application. This meant that customers would be prompted to download over 3GB of Office 2016 updates each and every month. Obviously, this resulted in lengthy download and update times, especially for customers on low-bandwidth connections.

Beginning with the 15.18 release, Microsoft AutoUpdate (MAU) will inspect the local version of Office installed on the computer and automatically offer a smaller 'delta' update to computers running within an N-1 update window. Delta updates are on average 77% smaller than full updates, which means that download times will be much shorter.

Background

Office 2011 for Mac also used the notion of smaller updates, but up until now, this technology was not available to Office 2016 users. The underlying architecture in 2016 is significantly different to 2011. Specifically, all 2016 apps are sandboxed and code-signed. App bundles (such as Word) contain a complete set of resources to function, and code signing guarantees that there has been no tampering of files (i.e. additions, modifications, removals). This architecture fosters an environment where apps are more secure and reliable, but trades flexibility of updates.

Solution

Microsoft has developed a technique that performs a file diff between given builds that includes the code signature of the application. The delta installer will take care of adding new and modified files, removing deleted files, and updating the code signature to retain the security and integrity of the app bundle.

While the new technique significantly reduces the size of Office 2016 updates, there are differences over what was provided with Office 2011:

a. Office 2011 used combo updates, which does not impose the N-1 limitation of delta updates. For example, a customer could deploy Office 2011 14.1.0 and use a combo updater to immediately upgrade to 14.5.9, thus bypassing many interim upgrades.
b. Office 2011 apps were not code signed, and file structures were not strictly validated. This meant that Office 2011 combo updates were extremely small (e.g. ~125 MB for the suite).
c. Office 2011 updates were suite-based, whereas Office 2016 updates are per-app.

Supportability

MAU uses a series of complex rules to determine whether an existing computer is eligible for receiving a delta update. These rules are encoded into a series of XML files that reside on http://www.microsoft.com/mac. MAU will use these rules, plus local version data and make a determination if a delta update can be applied. If MAU determines that a computer is not eligible for a delta update, it will automatically offer full updates.

Given the nature of this complexity, we do not encourage customers to manually download and apply delta updates, as they may be unsuitable for the current installation. As such, the KB article that accompanies one of our monthly updates will only contain download links to the full updates, as they are guaranteed to work in all existing deployments.

NOTE: The delta installer itself will not error or warn if a user attempts to manually apply it to an existing version which is ineligible for the delta update. In some cases, performing this type of operation will cause the app to no longer launch.

To verify the integrity of an app bundle such as Word 2016, run the following command from Terminal:

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codesign –vv --deep /Applications/Microsoft\ Word.app
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If the code signature is intact and the app is in a supportable state, you'll see a message stating that the app meets the 'Designated Requirement'. If the code signature is invalid, or the app is in an unsupportable state, codesign will provide a list of files that differ from what it expected.

If an app gets into an unsupportable state, simply apply the full update or re-run the suite installer to correct the situation. http://macadmins.software is a good resource containing direct download links to all released versions of Office 2016 for Mac.

MAU itself contains a fail-safe mechanism where it will automatically perform a code signature check after applying a delta update. If it finds the signature is invalid, it will automatically self-heal by downloading and applying a full update so that the user is left in a functional and supportable state.

Q&A

1. What are the exact size differences between a delta and full update?
   Taking 15.18 as an example, a full update for all five Office apps constitutes a download of 3.34 GB. In contrast, a delta update is only 784 MB.

2. What is the most-efficient supportable method for enterprise customers who use third-party deployment solutions (rather than MAU) to perform updates?
   As the suite installer is ~1.3GB in size, which is considerably smaller than a full update, it is supportable to update an older installation by 're-installing' using a newer version of the suite installer.

3. In the case of a hotfix release (e.g. Word is 15.17.1 whereas other apps are 15.17.0), can a delta update be applied to both the .0 and .1 versions of the package?
   Yes. The diffing technology that we use will baseline all hotfix releases in the N-1 window, so in this example, a delta update can be applied to all 15.17.x apps, regardless of hotfix version.

4. Are there any other technologies available to make downloads faster?

Yes, starting with the 15.17 release in December 2015, we moved all update packages to an Akamai-based global content delivery network (CDN). Previous to 15.17, updates were stored in the Microsoft Download Center. Many customers have reported significant download improvements due to this change.

5. Are there any other improvements planned for delta updaters?
   Yes. We envisage further download savings by consolidating per-app delta updates into a suite delta update. This is planned for a future release.