**Enhancing EMV Transaction Performance**

**The U.S. EMV migration has reached a tipping point and is now widely adopted (including both cards in circulation and terminal acceptance). The industry is now turning its attention towards solution optimization to enhance the transaction performance and make EMV faster.**

**The major payment brands have recently come up with an optimized method to run an EMV transaction – also known as Quick Chip and M/Chip Fast. This eliminates the time that it takes to go online and perform the second step of an EMV transaction which includes issuer authentication and issuer scripts.**

**Although Quick Chip and M/Chip Fast improve transaction performance, as we don’t have to wait for the issuer response before removing the card, there are other aspects that affect transaction performance regardless of whether Quick Chip or standard EMV is being used. These have to do with the amount of communication that happens between the card and terminal – with the communication speed currently set to 9600 bits per second.**

**Ultimately, the less interaction between the card and the terminal and the faster the communication speed, the faster the EMV transaction will become. There are two key elements in achieving a faster EMV transaction:**

**Supporting the Payment System Environment (PSE) option on both the card and the terminal.**

**•   EMV supports two methods for performing Application Selection – Explicit Selection and PSE. The main difference between them is the number of commands that are sent between the card and the terminal. The more commands required the more time it will take to complete the transaction. With each command taking between 50-100ms to complete, the difference can be significant. The more AIDs supported the more commands that are required to complete Application Selection. Many terminals that support all the cards brands (including credit, domestic debit and international debit Application Identifies or AIDs) may have as many as 14 AIDs.**

**•   In this case, for a card with one AID, the number of commands required to complete Explicit Selection is 15 (including the final select) – and would take anywhere between 750ms and 1.5 seconds to complete. When using PSE, the number of commands with the same card would be reduced to 4 (including final select and with standard PSE implementation) – and would take anywhere between 200ms and 400ms (this can even be reduced to 2 commands if the PSE is optimized on the card).**

**Number of records in the Application File Locator (AFL)**

**•   The more records the terminal needs to read the more time it takes to complete the transaction. By optimizing the card personalization and reducing the number of records used in the AFL, performance can be enhanced. Reducing the number of records on its own is not enough, however, as the main issue is the amount of data that is being transferred between the card and terminal. Many cards in the market currently have dummy records with dummy data to simplify the personalization of multiple profiles. However, by removing data that is not used (e.g. offline certificates when no ODA is used), the performance of the transaction will also be enhanced.**

**In addition to the two key elements above, the industry is constantly looking into additional options for optimizing the EMV transaction speed. As described above, the current communication speed of the transaction is 9600 bits per second and with some small personalization changes to the cards (no change needed for the POS), we can achieve communication speeds of 38400 bits per second – and even that may become faster over time. Although we can speed up the communication to four times the current speed, it will only increase performance by 10%. That is why it is always important to make sure the two key elements described above are considered as part of the issuer card profile definition.**

**So how does your terminal and card perform? How long does it take for you to perform an EMV transaction? B2 can help give you a full analysis and work with you to optimize performance, or walk you through an in-depth**[**EMV Workshop**](https://b2ps.com/store/b2-university/emv-for-us-debit/)**to get you there.**[**Contact us**](https://b2ps.com/contact-us/)**today to learn more about this, or visit our**[**eLearning**](https://b2ps.com/product-category/b2-university/)**site.**