

## Real Time Information Generating the RTI Cross-reference (RTI hash)

### Background

HMRC announced on 13 May 2011 that in response to concerns expressed by the payroll industry and others the strategic Bacs channel for RTI would be deferred and a revised technical solution would be adopted for an interim period.

### Interim Solution

The interim solution uses the existing Internet and EDI filing channels to submit RTI data. On 13 May, HMRC announced that in addition to the tax data within the RTI submission, a cross-reference (hash) will also be required for each employee submission **where employees are paid via the Bacs system**. The field to accommodate the hash was included in the technical specifications published by HMRC on 30 June 2011.

### Purpose of the cross-reference

The cross-reference will enable HMRC to corroborate the tax data returned against the payment made to the individual. This will assist DWP's administration of Universal Credit.

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***What is involved in the cross-reference?***

There are two parts to the cross-reference:

- (a) a hash included in the RTI submission to HMRC;
- (b) a random value inserted in field 7 of the Bacs payment instruction.

***Have the banks agreed to this use of Field 7?***

The scheme member banks have agreed to this in principle and the Scheme and HMRC have agreed a course of action for the resolution of outstanding issues.

***Who needs to supply a cross-reference?***

Employers paying their staff using Bacstel-IP must include a hash (and the associated random string in their payment instructions) in their RTI submission. . Employers who use Extended Transmission Service (ETS) or SwiftNet Transmission Service (STS), to submit Standard 18 payment instructions should also include a hash in the Standard 18. Employers who submit payment instructions via a bank payment product- e.g. those using internet, telephone or fax banking – will only be required to include a hash in the RTI if their bank provides a facility for them to include a random string in the payment instruction submitted to Bacs .

***What happens if a cross-reference is not provided?***

Information about unverified RTI will inform risk-assessments carried out by HMRC and DWP in the course of their administration of tax and benefits.

***How will HMRC know that an employer has paid by Direct Credit but not included sufficient details to allow a cross-reference to be made?***

This will be picked up through routine compliance checks

***Who should produce the hash and random value?***

The hash needs to be generated by payroll software and all of the elements used to create the hash, including the random string, need to be present in the Standard 18 file used by Bacs for payment. The hash will then be reproduced as part of the payment process and sent with confirmation of payment to HMRC for matching with the tax data hash.

***Which algorithm should I use to produce the hash?***

You should use the 256 Secure Hash Algorithm (SHA – 256). Object libraries for this exist in most commonly used coding languages.

***What do I need to include in my payment instruction?***

You need to insert a value in field 7 of standard 18. The value of the field must be a solidus – “/” – to be inserted in character position 32 followed by a three alpha-numeric character random string generated from the following characters in positions 33-35

hyphen (-)  
full stop (.)  
solidus (/) (hexadecimal value 2F)  
zero to 9  
A-Z (as specified for upper case alphabet)

So examples would be: “/123“, “/ABC“, “/..A“ “/9C-“, “/...”

The combination of the random string, the amount to be paid and the sort code combination provides a sufficient degree of uniqueness to allow effective matching to take place.

The random string needs to be generated with each relevant payment from the employer, so that where an individual is paid the same amount on a regular basis the random string allows the different transactions to be identified.

***Which data items should I hash?***

You should hash:

- (a) the four character random string inserted or to be inserted in the Std 18 payment file – the solidus “/” plus the three character random value;
- (b) the sort code of the originator’s bank (6 digits);
- (c) the sort code of the recipient’s bank (6 digits)

(d) the amount of payment in pence – see next question (11 digits).

The hash should be generated from the concatenated string abcd with no spaces or characters between.

The hash produced will look like:

a8e88f215cc98f40a2d0c47c49d0b09f4593d9bb81aef118202987a8cc0e3689

which is the hash produced when “/A..”, “100000”, “309144” and “00000125671” is put through the algorithm.

***When should the hash be produced?***

The hash should be produced and submitted at or before the time payment instructions are issued. The exact timing will be determined by your payroll software provider.

***What is the amount of payment to be included in the hash?***

This is the net amount of the payment that will reach the recipient’s bank account and should match the amount derived from the following sum:

- total pay less statutory deductions (RTI box 59); less
- further deductions after tax, NI etc (box 58B); less
- value of benefits taxed through the payroll (box 60); plus
- payments not subject to tax or NI (box 58A).

***What will HMRC do with the hash?***

HMRC will match the hashes returned with the RTI data against hashes generated during payment file processing to inform HMRC’s compliance activity. This data will also support DWP’s administration of Universal Credits.

***My software sends payment to Bacs Approved Software Service(BASS) supplier(s) other than in Standard 18 format. What do I have to do?***

You will either have to agree a new format for exchange of the payment data with all the BASS suppliers you support or change your payment files to Std 18 format.

***I don't submit Standard 18 files - how will I send this information to my BASS provider?***

BASS providers will need to work with Payroll software providers and employers to agree any changes to the format of submission of payment information.

***Won't you get lots of duplicate hashes?***

We have undertaken modelling and are satisfied that on a typical day we would expect there to be fewer than 0.1% instances of duplicate hashes.

***If you put the amount in the hash won't that increase the number of failures?***

It is vital that the payroll software ensures that the value used to calculate the hash (see above) is equal to that in the payment instruction. If alterations are made between payroll software and BASS software then the final amount to be paid needs to be reflected in the hash attached to each bit of RTI or to an amalgamated single RTI submission.

So RTI information with amounts to be paid of A, B and C is amalgamated into a single payment D between the payroll and the BASS software. In this case the hash needs to be produced for amount D and attached to RTI information A, B & C. On receipt the hash on D will match A, B & C and a supplementary test carried out to ensure that  $A+B+C = D$ .

***Will you check input files for randomness?***

It will be obvious from inputs if an employer is using software that is not generating truly random values and this will inform compliance activity.

***Why not wait and just move to the original proposal for a single standard?***

The implementation of the strategic solution utilising the Bacs channel was deferred following consultation. The Interim solution addresses concerns raised during consultation whilst allowing HMRC to support the introduction of Universal Credit.

**RTI Cross reference Version 2.0**  
**HMRC 22<sup>nd</sup> July 2011**