



WiMAX FORUM® WiMAX™ ROAMING INTERFACE
based on WiMAX Forum Certified™ Products

Stage 2 Part 4: Financial Settlement Release 1.0 Version 2

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CONTENTS

1	WiMAX™ Financial Settlement Reference Point	1
1.1	Introduction and Scope	1
1.2	Control Plane Protocols and Procedures	1
1.2.1	Flow	1
1.2.2	Rule	2
1.2.3	Procedures	2
1.2.4	Dispute Process Configuration	2
1.2.5	WiMAX™ Electronic Invoice Reference Point for WiMAX™ Networks	3
1.3	Limitations of this Specification	9
2	Revision History	10

List of Figures

Figure 1: X6 Flow 1

1 WiMAX™ Financial Settlement Reference Point

1.1 Introduction and Scope

Settlement involves validating the correctness of the financial values assigned during data clearing, calculating an overall financial position for each Network Service Provider (NSP), performing foreign exchange for NSPs with amounts due in currencies other than their own, making the corresponding payments, and tracking any outstanding financial obligations.

The scope of this document is to address functions and processes related to receiving X4 Reference Point files from the WRI Clearing logical function, calculating financial position based on X4 Reference Point files, performing currency conversion, and creating X6 Reference Point files (a.k.a. Electronic Invoice Files). See the WiMAX™ Roaming Interface (WR) Stage 2: Part 0 for a high-level description of the WRI architecture and a list of commonly used references, acronyms, and terms.

1.2 Control Plane Protocols and Procedures

This section provides the detailed description of WiMAX™ financial settlement.

1.2.1 Flow

The WRI Financial Settlement logical function receives the X4 Reference Point files from the WRI Clearing logical function. The X4 Reference Point files are used in calculating the Net Financial position when generating an X6 Reference Point file, a.k.a. the Electronic Invoice File, which is sent to the H-NSP. The WRI Financial Settlement logical function also performs currency conversion and facilitates in the electronic transfer for payment of invoices. Figure 1 depicts the action of the WRI Financial Settlement logical function once it has received an X4 Reference Point file.

R-[X6-S2-1] The data carried through the X4 Reference Point SHALL be used to derive data for the X6 Reference Points.

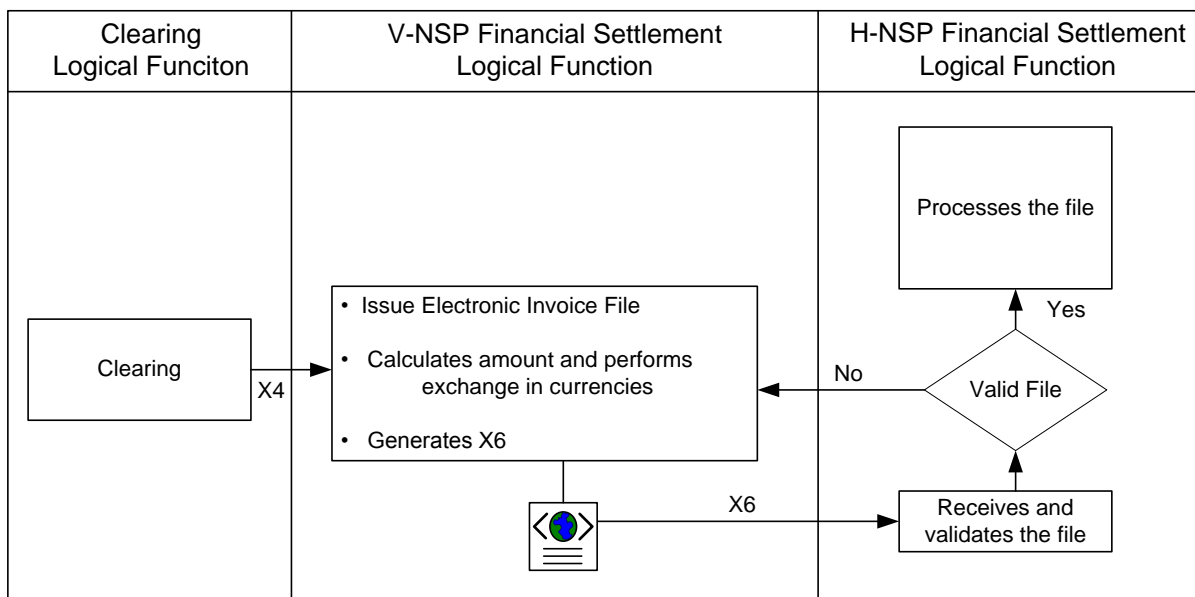


Figure 1: X6 Flow

1.2.2 Rule

R-[X6-S2-2] The billing cycle SHALL be based on a calendar month.

1.2.3 Procedures

1.2.3.1 File Naming Convention

Charge Files

- Charge files must use the following naming convention

Financial charges (Charge)

- FCC_<Sender><Recipient>_<Seqno (999999)>

Financial rejects (Charge)

- FRC_<Sender><Recipient>_<Seqno (999999)>

Financial acknowledge (Charge)

- FAC_<Sender><Recipient>_<Seqno (999999)>

Test Files

Test files must use the following naming convention

- Financial charges (Test)
 - FCT_<Sender ><Recipient>_<Seqno (999999)>
- Financial rejects (Test)
 - FRT_<Sender><Recipient>_<Seqno (999999)>
- Financial acknowledge (Test)
 - FAT_<Sender><Recipient>_<Seqno (999999)>

1.2.3.2 Delivery Mechanism

1.2.3.2.1 FTP

R-[X6-S2-3] FTP and secure FTP SHALL be supported as default protocols unless otherwise agreed between the responsible entities exchanging X6 Reference Point files.

R-[X6-S2-4] The initial transmission of a X6 Reference Point file SHOULD use a temporary name until the process is over.

R-[X6-S2-5] Once the X6 Reference Point file has been successfully transferred, it SHOULD be renamed following the agreed naming convention.

1.2.4 Dispute Process Configuration

Daily reconciliation which occurs as a part of the Clearing process should alleviate large mismatches on the invoices at the time of the financial settlement. *This document does not address any disputes between NSPs and subscribers or fraud settlement between the WiMAX™ operators.*

R-[X6-S2-6] Unless otherwise agreed between the roaming partners the dispute process SHOULD NOT stop the settlement process.

R-[X6-S2-7] The variance in the disputed amount SHOULD be configurable as a percentage and a fixed amount of the total invoice.

R-[X6-S2-8] The settlement system SHALL be able to retain records for a configurable duration of time to handle disputes.

The spirit of good faith and best business practices are to be shown in the roaming agreement addressing and considering the following aspects.

R-[X6-S2-9] The WiMAX roaming partner SHALL designate who to escalate or to raise any claims regarding amount mismatches.

For this release, it is recommended to settle the disputes by issuing credit notes.

1.2.5 WiMAX™ Electronic Invoice Reference Point for WiMAX™ Networks

The assumption in this section is that the WRI Financial Settlement logical function has received input from the WRI Clearing logical function via the X4 Reference Point. Based on that information, the WRI Financial Settlement logical function will generate an Electronic Invoice, also referred to as the Financial Settlement file, or X6 Reference Point file, in this document.

1.2.5.1 X6 Reference Points

1.2.5.2 Elements

R-[X6-S2-10] All date and time elements included in a X6 Reference Point file SHALL be specified in GMT.

1.2.5.2.1 Header – (Mandatory)

Element Name	Element Description and Requirement	Mandatory or Optional Element
Sending WRI Code	R-[X6-S2-52] The Sending WRI Code field identifies the Serving operator and SHALL be populated before the Financial Settlement file, i.e., the X6 Reference Point file, is received by the Home or Home exchange provider. The Sending WRI Code SHALL have a unique ID.	Mandatory
Receiving WRI Code	R-[X6-S2-53] The Receiving WRI Code field identifies the Home operator and SHALL be populated before the Financial Settlement file, i.e., the X6 Reference Point file, is received by the Home or Home exchange provider. The Receiving WRI Code SHALL have a unique ID.	Mandatory
Sending WRX WRI Code	R-[X6-S2-54] The Sending WRX WRI Code field identifies the Sending Exchange Provider and SHALL be populated before the Financial Settlement file, i.e., the X6 Reference Point file, is received by the Home or Home exchange provider, if applicable. This field is a unique code by which the sending CSN's exchange provider is identified. If there is no Sending Exchange Provider, this field is null. An Exchange Provider SHALL have a unique ID.	Mandatory
Receiving WRX WRI Code	R-[X6-S2-55] The Receiving WRX WRI Code field identifies the Receiving Exchange Provider and	Mandatory

Element Name	Element Description and Requirement	Mandatory or Optional Element
	SHALL be populated before the Financial Settlement file, i.e., the X6 Reference Point file, is received by the Home or Home exchange provider. This field is a unique code that identifies the receiving CSN's exchange provider. If there is no Receiving Exchange Provider, this field is null. An Exchange Provider SHALL have a unique ID.	
Visited NSP ID	R-[X6-S2-13] The Visited NSP ID SHALL be populated before the file is received by the Home or Home exchange provider. This field is a unique code that identifies the visited CSN as specified in the NWG Network Architecture Stage 3 Specification.	Mandatory
Home NSP ID	R-[X6-S2-14] The Home NSP ID SHALL be populated before the file is received by the Home or Home exchange provider. The field is a unique code that identifies the home CSN as specified in the NWG Network Architecture Stage 3 Specification.	Mandatory
Decimal Places	<p>The Decimal Places field identifies the number of decimal places used to represent all the monetary values within this file. The decimal place applies to the following elements within this file: charges and taxes.</p> <p>R-[X6-S2-16] The default value of the Decimal Places for charges and taxes SHALL be 2 unless otherwise specified.</p>	Optional
Settlement Date	<p>The Settlement Date represents the first day of the settlement period.</p> <p>R-[X6-S2-17] The Settlement Date shall be the first day of the month of the Settlement Period.</p> <p>R-[X6-S2-19] The Settlement Period SHALL be calendar month.</p> <p>R-[X6-S2-20] The Settlement Date SHALL always be present in GMT.</p>	Mandatory
GMT Time-Zone Offset	<p>The GMT Time-Zone Offset field represents the difference between the GMT and the sending party's local time.</p> <p>R-[X6-S2-21] The GMT Time-Zone Offset field SHALL be present.</p>	Mandatory
File Creation Timestamp	<p>File Creation Timestamp field represents the timestamp at which the Electronic invoice file was created or last modified. The time is given in the local time of the Sending Party.</p> <p>R-[X6-S2-22] The File Creation Timestamp SHALL be present in GMT.</p>	Mandatory
File Type	The File Type field identifies if the field is a Charge File or a Test File.	Conditionally Mandatory

Element Name	Element Description and Requirement	Mandatory or Optional Element
	R-[X6-S2-51] The File Type SHALL be present if the file is a test file else it is assumed to be a Charge file.	
Release	R-[X6-S2-25] The Release SHALL be populated with the WRI Stage 3 Financial Settlement Specification Release used to create the X6 Reference Point file.	Mandatory
Version	R-[X6-S2-26] The Version SHALL be populated with the WRI Stage 3 Financial Settlement Specification Version used to create the X6 Reference Point file.	Mandatory
Exchange Rate Information	<p>Exchange Rate Information is used to define exchange rates used within this file.</p> <p>R-[X6-S2-27] Exchange Rate Information SHALL be populated if currency conversion has been performed.</p> <p>Exchange Rate quoted by the (International Monetary Fund (IMF) of the 23rd day of the previous month is to be used. If no IMF exchange rate is available on that day, the quote of the previous business day will be used. See WRI Stage 2 Part 0 for the reference to the IMF Exchange Rate Conversion Table.</p>	Conditional Mandatory
IOT Currency	<p>IOT Currency represents the original Currency in which the charges were applied to session usage. (Normally this is the currency the Visited NSP uses to define its tariffs).</p> <p>R-[X6-S2-28] The IOT Currency Code SHALL be present.</p>	Mandatory
File Currency	<p>The File Currency is the currency that defines the all the monetary values within this file.</p> <p>R-[X6-S2-29] File Currency defines the currency of the monetary fields (Charges and Taxes) used in the X6 Reference Point file. This is the currency agreed in the Roaming Agreement and used to exchange files between roaming partners.</p>	Mandatory
Exchange Rate	<p>The Exchange Rate is the rate used to convert Source currency to Destination currency.</p> <p>R-[X6-S2-30] The Exchange Rate field SHALL contain the value of the exchange rate expressed as the ratio of units of the IOT Currency to the units of the File Currency. That is, Exchange Rate = IOT Currency divided by File Currency</p> <p>R-[X6-S2-31] The Exchange Rate SHALL always be present in six decimal places.</p>	Mandatory
Exchange Rate Date	The Exchange Rate Date is the date when the exchange rate is pegged.	Mandatory

Element Name	Element Description and Requirement	Mandatory or Optional Element
	R-[X6-S2-32] The Exchange Rate Date SHALL be present.	
Type	Type is a code representing the Settlement Procedure agreed between the Parties. R-[X6-S2-34] The Type of settlement field SHALL always be present. Possible values for Type of settlement are: N: Net Settlement D: Direct Payment	Mandatory
Payment Terms	The Payment Terms field provides the description of the terms of payment as agreed by the Parties (i.e “due amount immediately”, or “due amount in 10 days”). R-[X6-S2-35] The Payment Terms SHALL be always be present.	Mandatory
Due Date	The Due Date represents the date the payment is due. R-[X6-S2-36] The Due Date SHALL be present in GMT.	Mandatory

1.2.5.2.2 Electronic Invoice – (Mandatory)

Element Name	Element Description and Requirement	Mandatory or Optional Element
Daily (X5) File List Information	The Daily (X5) File List Information field provides a list of all the X5 files for which settlement is requested. R-[X6-S2-56] Daily File List Information SHALL be present if one or more X5 Reference Point files are included in the settlement. R-[X6-S2-57] The Daily File List Information SHALL contain the following fields: 1. Total Charges 2. Total Duration 3. Total Mobile Originated Volume 4. Total Mobile Terminated Volume 5. Total Records Transmitted	Conditionally Mandatory
Sender Company Name	R-[X6-S2-37] The Sender Company Name, which is the name of the company that acts as Invoicing Party, normally the V-NSP, SHALL always be present.	Mandatory
Sender Company Physical Address	The Sender Company Physical Address is the element that provides the postal address of the sender of the invoice as specified by the Invoicing Party. This is the address where the invoice is to be returned if it cannot be delivered.	Mandatory

Element Name	Element Description and Requirement	Mandatory or Optional Element
	R-[X6-S2-38] The Sender Company Physical Address SHALL always be present.	
Sender Legal Address	<p>The Sender Legal Address is the element that provides the legal postal address of the Invoicing Party.</p> <p>R-[X6-S2-39] The Sender Legal Address SHALL always be present.</p>	Mandatory
Sender Legal Registration Number	The Sender Legal Registration Number is the tax registration identifier of a Company.	Optional
Sender Contact Information	<p>The Sender Contact Information is the point of contact from the Invoicing Party for questions/issues regarding the invoice.</p> <p>R-[X6-S2-40] The Sender Contact Information SHALL always be present.</p>	Mandatory
Recipient Company Name	R-[X6-S2-41] The Recipient Company, which is the name of the company that acts as Invoiced Party, normally the H-NSP, SHALL always be present.	Mandatory
Recipient Company Physical Address	<p>The Recipient Company Physical Address is the element that provides the postal address of the recipient of the invoice as specified by the Invoiced Party. This is the address where the invoice is to be sent if it cannot be delivered electronically.</p> <p>R-[X6-S2-42] The Recipient Company Physical Address SHALL always be present.</p>	Mandatory
Recipient Legal Address	<p>The Recipient Legal Address is the element that provides the legal postal address of the Invoiced Party.</p> <p>R-[X6-S2-43] The Recipient Legal Address SHALL always be present.</p>	Mandatory
Recipient Legal Registration Number	The Recipient Legal Registration Number is the tax registration identifier of the Company.	Optional
Recipient Contact Information	<p>The Recipient Contact Information is the point of contact from the Invoiced Party for questions/issues regarding the invoice.</p> <p>R-[X6-S2-44] The Recipient Contact Information SHALL always be present.</p>	Mandatory
Invoice Date	<p>The Invoice Date represents the Invoice Date the invoice was created.</p> <p>R-[X6-S2-45] The Invoice Date SHALL be present in GMT format.</p>	Mandatory
Invoice Number	<p>The Invoice Number is the unique number that identifies the invoice.</p> <p>R-[X6-S2-46] The Invoice Number, which is a unique identifier assigned by the Invoicing Party, SHALL be present.</p>	Mandatory

Element Name	Element Description and Requirement	Mandatory or Optional Element
Total Net Amount	<p>The Total Net Amount represents the total amount of all charges for the settlement period.</p> <p>R-[X6-S2-47] The Total Net Amount based on agreed currency SHALL always be present.</p>	Mandatory
Total Tax Amount	<p>The Total Tax Amount is the total tax amount due to the sending party.</p> <p>[X6-S2-48] The Total Tax Amount based on agreed currency SHALL always be present.</p>	Mandatory
Total Credit Amount	<p>The Total Credit Amount is the amount to be subtracted from an outstanding invoice as authorized by the issuer of the invoice. This may be the result of the resolution of a dispute or the correction of other invoicing errors.</p> <p>[X6-S2-49] The Total Credit Amount based on agreed currency SHALL always be present.</p>	Mandatory
Credit Amount Description	<p>The Credit Amount Description is an explanation of the credit note and reference of the credit note including number.</p>	Optional
Total Amount Due	<p>The Total Amount Due represents the total amount due to the sending party. Calculated as Total Net Amount – Total Credit Amount + Total Tax Amount</p> <p>R-[X6-S2-50] The Total Amount Due is the total amount based on agreed currency SHALL always be present.</p>	Mandatory

1.3 Limitations of this Specification

This specification is not intended as a development or test document. This document describes the interfaces/reference point rules and procedures. Any specific implementation, code unit or system testing consideration shall be address in a separate document.

2 Revision History

Revision	Changes	Date
1	Initial Publication	August 4, 2008
2	<p>Modifications to align with WRI Release 1.0 Stage 3</p> <p>1) WRI Release 1.0 Stage 3: Part 4 Financial Settlement Comments: 1763, 1765, 1767, 1768, 1769, 1771, 1773, 1780, 1784, 1788, 1790, 1792, 1794, 1795, 1796, 1805, 1823</p> <p>2) Exchange Rate will always be expressed in six Decimal places</p> <p>3) Editorial changes include:</p> <p>a) Added the letter S2 to all requirements.</p> <p>b) Changed “Copyright ©” to “Copyright”</p> <p>c) Applied the recommended ® and TM where appropriate</p> <p>d) Change “interface” to “Reference Point” where applicable</p> <p>e) Expanded acronym IMF and referred to WRI Part 0 for the Exchange Rate Conversion Table.</p> <p>f) Introduced Revision History section</p>	March 23, 2009
2	<p>Modifications include:</p> <p>1) Editorial Changes:</p> <p>a) Changed X4 file and X6 file to ‘X4 Reference Point file’ and ‘X6 Reference Point file’ respectively.</p> <p>b) Titles in ‘Figure 1 X6 Flow’ has been changed and font is adjusted.</p> <p>c) Assigned missing requirement numbers.</p> <p>d) Changed the title page and headers to match the proposed TCC document number format.</p> <p>e) Changed the word ‘module’ to ‘WRI logical function’ throughout the document.</p> <p>f) Updated the Cover Page.</p> <p>2) Technical changes</p> <p>a) Requirement: R-[X6-S2-1] has been changed FROM: The data carried through the R5 SHALL be used to derive data for the X6. TO: The data carried through the X4 Reference Point SHALL be used to derive data for the X6 Reference Points</p> <p>b) The Version and Release fields were changed to align with WRI Stage 3.</p> <p>c) R-[X6-S2-46] is Changed FROM: R-[X6-S2-46] The Invoice Number, which is a unique identifier assigned by the Invoicing Party, SHALL be formatted as number with 5 digits (e.g. 99999) TO: The Invoice Number, which is a unique identifier assigned by the Invoicing Party, SHALL be present</p>	May 3, 2009
2	Changes include editorial modifications made during May 11, 2009 Dublin meeting	May 15, 2009
2	WiMAX Forum Board of Director Approved	June 24, 2009