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# SkyBitz XML Data Delivery Architecture

Version 2.67

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Date	Ver of XML DTD	Revision History	Contact
Spring 2002	1.0	Drafts in development	T. Thomas
Winter 2003	1.1	Release	M. Roden
Spring 2003	1.2	Update	M. Roden
Spring 2003	1.3	Update	M. Roden
Summer 2003	1.4	Update	M. Roden
Fall 2003	1.5	Update	M. Roden
Summer 2004	2.20	Release	M. Roden
Fall 2004	2.30	Update	M. Roden
Winter 2004	2.40	Update	M. Roden
Spring 2005	2.41	Update	L.Surabhi
Spring 2005	2.42	Update	U.Shankar
Summer 2005	2.43	Update- Details of QuerySetups Data Pull Request	L.Surabhi
Fall 2005	No change	Corrected sample XML querystrings to point to latest version.	L. Surabhi
Spring 2006	No change	Update- Included an option to sort results for QueryPositions	L.Surabhi
Spring 2006	No Change	Update- Enhanced to support Asset Management operations via XML	L.Surabhi
Spring 2006	2.50	Added landmark type to results of QueryPositions	L.Surabhi
Summer 2006	2.51	Added EPM Flag to results of QueryPositions	L.Surabhi
Summer 2006	2.52	Added Hour Meter and Hour Counter to results of QueryPositions – Driven by user preference setting in Insight for the XML user	L.Surabhi
Fall 2006	2.52	Added support for Groups Management over XML request	L.Surabhi
Fall 2006	2.52	XML Response Encoding set to UTF-8	L.Surabhi
Spring 2007	2.52	Configure Assets- Due to time sync issues between servers, allows actionDates to be within a certain period in future.	L.Surabhi
Summer 2007	2.53	XML Lookups based on date/time ranges will shift the start time by a few seconds to avoid skipping delayed positions that are at the boundary of lookup times in the request.	L.Surabhi
Spring 2008	2.54	XML Lookups to provide <city> for customer landmark positions.	L.Surabhi
Spring 2008	2.54	Configure Assets enhancement - support for action user name Simplex Enhancement – Page/Panic/Profile features prevent these actions on Simplex Devices	L.Surabhi

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Spring 2008	2.55	Version 2.55 – Position Lookups enhanced to return tractor id in results Added table of references for common values for sensor data	L.Surabhi
Summer 2008	2.55	Configure Assets- -deinstall and replace can mark the old MT as to-be-RMA'ed.	L.Surabhi
Spring 2009	2.55	Added details for data elements	L.Surabhi
Spring 2009	2.56	Extended to include Reefer State on XML position lookup results	L. Surabhi
Summer 2010	2.56	Added DTTS Enable/Disable over XML	L.Surabhi
Fall 2012	2.57	Added speed/heading on Location Updates	L.Surabhi
Fall 2012	2.57	Clarified possible values for <inputstate>	L.Surabhi
Spring 2013	2.58	Added XML Data Push Service Support.  The XML DTD will be the same between Data Pull and Data Push. DTD Version 2.58 includes elements required for Data Push.	L. Surabhi
Summer 2013	2.58	Support Raptor and GTP Change Profiles with support to select the profile that should be temporarily disabled. Support Speed Violation Threshold Settings for Raptor	L.Surabhi
	2.59	Enhanced to support Mileage data over XML [ To be released in Aug/Sep ]  Version 2.59 additionally includes skyfence/lockdown details in location updates.	L.Surabhi
Spring 2014	2.59	Added <headinginddegrees> to xml data push messages.	L. Surabhi
Summer 2014	2.60	Additional data attributes such as locationid, journeydistance, totaldevicemileage, batchnum, transid added to XML output.	L.Surabhi
Fall 2014	2.61	Added Temperature to XML location poll and push interface	L. Surabhi
Winter 2014	2.62	Added group(s) , assetnote and device type on location xml ( push interface). Support for Query Install MT Status  Keepalive facility over XML Push interface  Added Query Total Device Mileage Facility	L. Surabhi

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		<p><b>Updated Mileage Push section to denote ability to setup Product level mileage push</b></p> <p><b>Added support to validate formatted asset note parameter input on Configure Assets Requests</b></p>	
Winter 2015	2.63	<p><b>Include Location Address into XML Poll requests</b></p> <p><b>Added support for nested landmarks.</b></p>	L. Surabhi
Winter 2015	2.64	<p><b>Include timeofreading on serial sensor output.</b></p> <p><b>Include circular or multipoint landmark identification</b></p> <p><b>Support for multiple locationid association with landmark</b></p> <p><b>Added appendix showing common serial devices</b></p>	L.Surabhi, C. Young
Winter 2015	2.65	<p><b>Support to associate Container ID and other attributes to Assets and retrieve over XML poll service</b></p> <ul style="list-style-type: none"> <li>• <b>Associate Container Details to Asset(s)</b></li> <li>• <b>End container details association</b></li> <li>• <b>Query For Container Associations</b></li> <li>• <b>View Container Details on QueryPositions</b></li> </ul>	L.Surabhi
Winter 2017	2.66	<p><b>Added tag &lt;messagereceivedtime&gt; to XML Poll requests.</b></p> <p><b>Added tag &lt;messagereceivedtime&gt; to XML Push service.</b></p> <p><b>Added tag &lt;devicetype&gt; to XML Poll requests.</b></p>	H.Jindal
Spring 2018	2.67	<p><b>Added &lt;secondaryid&gt;, &lt;branchname&gt;, &lt;acctid&gt;, &lt;agreementtype&gt;</b></p>	C. Young

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## 1 Introduction and Scope

The SkyBitz Operations Center (SOC) provides the data processing, storage, and delivery services for the SkyBitz network and the Global Locating System (GLS) service. The SOC is hosted at a remote site that provides high levels of availability, security, and reliability. Using data provided by Mobile Terminal (MT) units, the SOC determines Mobile Terminal status and position.

The SOC hosts a web based application, called InSight, for user access via standard Internet browsers. It can also deliver data directly to customer asset tracking and management systems, and allow customer software systems to interact with their Mobile Terminals for GLS position updates and other services. This document describes the methods, formats, and protocols used by software systems to communicate directly with the SOC.

### 1.1 Scope

This document describes the interfaces to the SOC for MT control and data delivery. This includes updated position data, external sensor data, and MT status and configuration parameters. It also contains the SkyBitz XML Document Type Definition (DTD).

## 2 Overall Architecture

The overall architecture for the delivery of data is shown in figure 1.

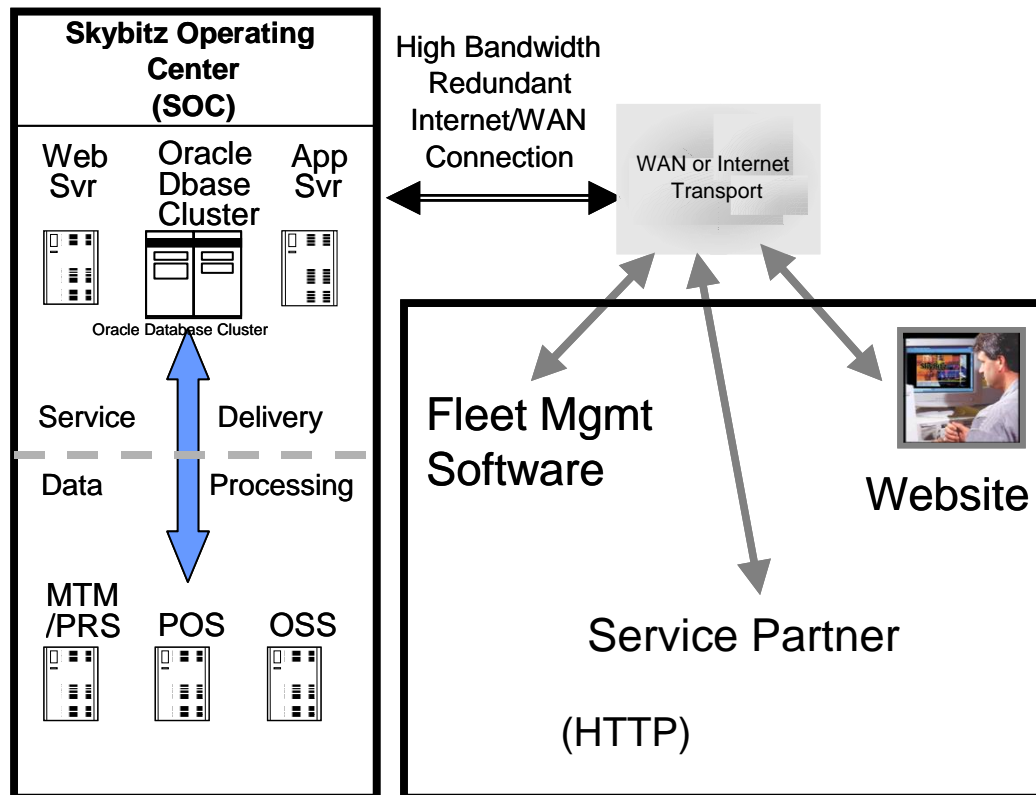


Figure 1 – GLS SOC Data Delivery Architecture

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## **2.1 Data Delivery Methods**

### **2.1.1 Data Pull**

Data pull allows the customer to actively query the SOC database for information using a structured HTTP Universal Resource Locator (URL) addressed to a specific Internet address and port number. The customer supplies the parameters of the request and validates using a correct User ID and password. The SOC then retrieves the requested information, packages it into an XML document, and then returns the data over the HTTP or HTTPS connection.

Data pull also allows the customer to retrieve the MT status and any external sensor data. Customers may pull the data as frequently as once every 5 minutes.

In addition to retrieving MT status, the Data Pull service includes support to send forward commands to the Mobile Terminals. To page Mobile Terminals for position and sensor data updates refer to section 6 ( Forward API ). The network schedule of Mobile Terminals can be read and modified temporarily by the customer to produce more frequent position reporting and access if required.

### **2.1.2 Data Push**

Customers who want to receive the MT Status and external sensor data into their systems with minimal latency can now subscribe to the XML Data Push service. Call SkyBitz Customer Care to request setup for this service. Both HTTP and HTTPS protocols are supported for the Data Push service and a minimum of 2 URLs must be provided by the customer.

Data Push is supported from DTD version 2.58 and above.

Customers who receive MT Status in the Data Push service should persistently store the received data in their system.

## **2.2 Data Delivery Formats**

The supported data format currently in use is an XML using a definition similar to the Trailer Tracking Interface Standard (TTIS) and fully described by the DTD Data Delivery Protocols

Data can be delivered to the customer's systems using both HTTP and HTTPS protocols.

Both Data Pull and Data Push will deliver content using the same DTD structure detailed in this document.

## **3 SkyBitz XML format**

### **3.1 XML Document Type Definition (DTD)**

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The format of SkyBitz position and event data is an XML document that can be validated using the SkyBitz XML Document Type Definition (DTD). The XML tags in the document are populated with data from the SkyBitz SOC. The character encoding used in the xml responses is UTF-8.

The following is the SkyBitz DTD, which can be used by commercially available XML parsers to validate SkyBitz XML documents:

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```

<?xml version="1.0"?>
<!DOCTYPE skybitz [
<!ELEMENT skybitz (error, transid? ,(gls | profile | setup | checkstatus |
mileage|totalmileage)* , batchnum?)>
<!ELEMENT error (#PCDATA)>
<!ELEMENT batchnum (#PCDATA)>
<!ELEMENT gls (mtsn,devicetype, asset?, messagetype, binary*, extpwr?,
serial*, latitude?, longitude?, speed?, heading?, headinginddegrees?,
journeydistance?,totaldevicemileage?,temperaturecelsius?,
temperaturefahrenheit?, battery?, time, quality?, landmark?,address?,
skyfence?, idle?,epmflag?,ehmeter?,ehcounter?,ats?, reeferstate?,transid?,
messagereceivetime)>
<!ELEMENT mtsn (#PCDATA)>
<!ELEMENT devicetype (#PCDATA)>
<!ELEMENT asset (assetid, tractorid?,assettype, owner, note?,
groups?,container?,secondaryid?,agreementtype?,branchname?,acctid?)>
<!ELEMENT tractorid (#PCDATA)>
<!ELEMENT assetid (#PCDATA)>
<!ELEMENT assettype (#PCDATA)>
<!ELEMENT owner (#PCDATA)>
<!ELEMENT note (#PCDATA)>
<!ELEMENT secondaryid(#PCDATA)>
<!ELEMENT agreementtype (#PCDATA)>
<!ELEMENT branchname (#PCDATA)>
<!ELEMENT acctid (#PCDATA)>
<!ELEMENT groups (groupname*)>
<!ELEMENT container (containerid, scac?, containertype?,truckingcompany?,
associateddtm)>
<!ELEMENT containerid (#PCDATA)>
<!ELEMENT scac (#PCDATA)>
<!ELEMENT containertype (#PCDATA)>
<!ELEMENT truckingcompany (#PCDATA)>
<!ELEMENT associateddtm (#PCDATA)>
<!ELEMENT groupname (#PCDATA)><!ELEMENT messagetype (#PCDATA)>
<!ELEMENT binary (inputid, inputname, inputval?, inputstate?, timeofreading?,
event?)>
<!ELEMENT inputid (#PCDATA)>
<!ELEMENT inputname (#PCDATA)>
<!ELEMENT inputval (#PCDATA)><!ELEMENT inputstate (#PCDATA)>
<!ELEMENT timeofreading (#PCDATA)>
<!ELEMENT event (#PCDATA)>
<!ELEMENT extpwr (#PCDATA)>
<!ELEMENT serial (serialtype, serialid, serialname, serialdata,
timeofreading?, event?)>
<!ELEMENT serialtype (#PCDATA)>
<!ELEMENT serialid (#PCDATA)>
<!ELEMENT serialname (#PCDATA)>
<!ELEMENT serialdata (#PCDATA)>
<!ELEMENT latitude (#PCDATA)>
<!ELEMENT longitude (#PCDATA)>
<!ELEMENT speed(#PCDATA)>
<!ELEMENT heading (#PCDATA)>
<!ELEMENT headinginddegrees (#PCDATA)>
<!ELEMENT journeydistance (#PCDATA)>
<!ELEMENT totaldevicemileage (#PCDATA)>

```

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```
<!ELEMENT temperaturecelsius (#PCDATA)>
<!ELEMENT temperaturefahrenheit (#PCDATA)><!ELEMENT battery (#PCDATA)>
<!ELEMENT time (#PCDATA)>
<!ELEMENT quality (#PCDATA)>
<!ELEMENT landmark (geoname,locationid?,city?, state, country, distance,
direction,geotypename, geoshape?,locationids?)>
<!ELEMENT geoname (#PCDATA)>
<!ELEMENT locationid (#PCDATA)>
<!ELEMENT state (#PCDATA)>
<!ELEMENT country (#PCDATA)>
<!ELEMENT distance (#PCDATA)>
<!ELEMENT direction (#PCDATA)>
<!ELEMENT address (street?, city?, state?, country?, postal?)>
<!ELEMENT street (#PCDATA)>
<!ELEMENT postal (#PCDATA)>
<!ELEMENT geoshape (#PCDATA)>
<!ELEMENT locationids (locationid*)>
<!ELEMENT idle (idlestatus, idleduration?, idlegap?)>
<!ELEMENT idlestatus (#PCDATA)>
<!ELEMENT idleduration (#PCDATA)>
<!ELEMENT idlegap (#PCDATA)>
<!ELEMENT epmflag (#PCDATA)>
<!ELEMENT ehmeter (#PCDATA)>
<!ELEMENT ehcounter (#PCDATA)>
<!ELEMENT ats (lsd,meridian,township,range,section)>
<!ELEMENT lsd (#PCDATA)>
<!ELEMENT meridian (#PCDATA)>
<!ELEMENT township (#PCDATA)>
<!ELEMENT range (#PCDATA)>
<!ELEMENT section (#PCDATA)>
<!ELEMENT profile (mtsn, asset, profilename, profilename, profileid,
profilepwr, profilestatus, time, lastupdate?, expiration?,
nextaction?,transid?)>
<!ELEMENT profilename (#PCDATA)>
<!ELEMENT profilename (#PCDATA)>
<!ELEMENT profileid (#PCDATA)>
<!ELEMENT profilepwr (#PCDATA)>
<!ELEMENT profilestatus (#PCDATA)>
<!ELEMENT lastupdate (#PCDATA)>
<!ELEMENT expiration (#PCDATA)>
<!ELEMENT nextaction (#PCDATA)>
<!ELEMENT setup (assettypedef*)>
<!ELEMENT assettypedef (assettype,assettypebase,customassettype,
assettypeattr*,note*)>
<!ELEMENT assettype (#PCDATA)>
<!ELEMENT assettypebase (#PCDATA)>
<!ELEMENT customassettype (#PCDATA)>
<!ELEMENT assettypeattr (assettypeattrname,assettypeattrval)>
<!ELEMENT assettypeattrname (#PCDATA)>
<!ELEMENT assettypeattrval (#PCDATA)>
<!ELEMENT note (#PCDATA)>
<!ELEMENT reeferstate (reefermake, interfacetype, contenttype, controlleron,
fuelpercent?, assetbatteryvoltage?, engineon?, enginemode?, enginesize?,
enginespeed?, engineerunhours?, engineswitchonhours?, enginestandbyhours?,
reeferoperatingstatus?, reeferalarmstatus?, activeprofileslotnumber?,
```

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```
ambienttemperature?, modezone1?, setpointtemperaturezone1?,
supplyairtemperaturezone1?, returnairtemperaturezone1?, modezone2?,
setpointtemperaturezone2?, returnairtemperaturezone2?, modezone3?,
setpointtemperaturezone3?, returnairtemperaturezone3?,
reeferremotetemperaturesensor1?, reeferremotetemperaturesensor2?,
reeferremotetemperaturesensor3?, doorstateopen?, doorswitchopen?,
remoteswitchlopen?, remoteswitch2open?, remotetemperaturesensor1?,
remotetemperaturesensor2?, remotetemperaturesensor3?)>
<!ELEMENT reeferalarmstatus (reeferalarmtype, reeferalarm*)>
<!ELEMENT reeferalarm (alarmid, alarmactive, alarmdescr?)>
<!ELEMENT reefermake (#PCDATA)>
<!ELEMENT interfacetype (#PCDATA)>
<!ELEMENT contenttype (#PCDATA)>
<!ELEMENT controlleron (#PCDATA)>
<!ELEMENT fuelpercent (#PCDATA)>
<!ELEMENT assetbatteryvoltage (#PCDATA)>
<!ELEMENT engineon (#PCDATA)>
<!ELEMENT enginemode (#PCDATA)>
<!ELEMENT enginesize (#PCDATA)>
<!ELEMENT enginespeed (#PCDATA)>
<!ELEMENT enginerunhours (#PCDATA)>
<!ELEMENT engineswitchonhours (#PCDATA)>
<!ELEMENT enginestandbyhours (#PCDATA)>
<!ELEMENT reeferoperatingstatus (#PCDATA)>
<!ELEMENT reeferalarmstatus (#PCDATA)>
<!ELEMENT activeprofileslotnumber (#PCDATA)>
<!ELEMENT ambienttemperature (#PCDATA)>
<!ELEMENT modezone1 (#PCDATA)>
<!ELEMENT setpointtemperaturezone1 (#PCDATA)>
<!ELEMENT supplyairtemperaturezone1 (#PCDATA)>
<!ELEMENT returnairtemperaturezone1 (#PCDATA)>
<!ELEMENT modezone2 (#PCDATA)>
<!ELEMENT setpointtemperaturezone2 (#PCDATA)>
<!ELEMENT returnairtemperaturezone2 (#PCDATA)>
<!ELEMENT modezone3 (#PCDATA)>
<!ELEMENT setpointtemperaturezone3 (#PCDATA)>
<!ELEMENT returnairtemperaturezone3 (#PCDATA)>
<!ELEMENT reeferremotetemperaturesensor1 (#PCDATA)>
<!ELEMENT reeferremotetemperaturesensor2 (#PCDATA)>
<!ELEMENT reeferremotetemperaturesensor3 (#PCDATA)>
<!ELEMENT doorstateopen (#PCDATA)>
<!ELEMENT doorswitchopen (#PCDATA)>
<!ELEMENT remoteswitchlopen (#PCDATA)>
<!ELEMENT remoteswitch2open (#PCDATA)>
<!ELEMENT remotetemperaturesensor1 (#PCDATA)>
<!ELEMENT remotetemperaturesensor2 (#PCDATA)>
<!ELEMENT remotetemperaturesensor3 (#PCDATA)>
<!ELEMENT reeferalarmtype (#PCDATA)>
<!ELEMENT alarmid (#PCDATA)>
<!ELEMENT alarmactive (#PCDATA)>
<!ELEMENT alarmdescr (#PCDATA)>
<!ELEMENT transid (#PCDATA)>
<!ELEMENT checkstatus (transid)>
<!ELEMENT mileage
(mtsn, asset, mileagecapable, mileagesetupstatus, mileagedetails*)>
```

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```
<!ELEMENT mileagecapable (#PCDATA)>
<!ELEMENT mileagesetupstatus (#PCDATA)>
<!ELEMENT mileagedetails (mileagedate,mileageInMiles, mileageInKM,
timestamp)>
<!ELEMENT mileagedate (#PCDATA)>
<!ELEMENT mileageInMiles (#PCDATA)>
<!ELEMENT mileageInKM (#PCDATA)>
<!ELEMENT timestamp (#PCDATA)>
<!ELEMENT skyfence (skyfencestatus,
departureskyfence?,departurelocationid?,arrivalskyfence?,arrivallocationid?)>
<!ELEMENT skyfencestatus (#PCDATA)>
<!ELEMENT departureskyfence (#PCDATA)>
<!ELEMENT departurelocationid (#PCDATA)>
<!ELEMENT arrivalskyfence (#PCDATA)>
<!ELEMENT arrivallocationid (#PCDATA)>
<ELEMENT totalmileage ( mtsn, asset, totaldevicemileage, timestamp) >
<!ELEMENT messagereceivedtime #PCDATA) >
]>
```

**Note:** Elements that are **mandatory and occur once** have no special characters following the element name, e.g. <error>.

**Note:** Elements that are **optional** (depending on the message content) **and can occur only once** have a '?' character following the element name, e.g. latitude?, which is present once in every gls element if the position of the Mobile Terminal is solved, but not present if a transmission does not result in a solved position.

**Note:** Elements that are **optional** (depending on the message content) **and can occur multiple times** have a '\*' character following the element name, e.g. gls\*, which occurs once for every Mobile Terminal message returned in the XML response.

### 3.1.1 Compound XML tags

- Field 1:** <skybitz> </skybitz> - these tags always enclose a SkyBitz XML interface response, which may contain many sets of GLS data, each set enclosed in <gls> </gls> tags, as well as one set of <error> </error> tags.
- Field 2:** <gls> </gls> - these tags enclose a GLS data set, and occur once for each Mobile Terminal included in the SkyBitz XML interface response.
- Field 3:** <asset> </asset> - these optional tags enclose asset information (i.e. trailer ID, vehicle ID) uniquely identifying the asset on which each SkyBitz Mobile Terminal is installed. If no Asset ID has been assigned to a Mobile Terminal installation, these tags will not be present.
- Field 4:** <groups></groups> - these optional tags enclose groups to which the asset is a member as of the time the message is composed for delivery.
- Field 5:** <binary> </binary> - these tags enclose binary sensor and event information. A binary sensor may have only 2 states (0 or 1). Each binary sensor corresponds to an "input" on the Mobile Terminal's I/O connector and is assigned its own unique number. A binary sensor can monitor a "switch closure" or connect / disconnect of an external power source. The Mobile Terminal can then be configured to transmit an Event message when the state of any monitored input changes.

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Example 1: If an Event occurs on Input 1 (input name = “Door”), the following is returned:

```
<messagetype>Event</messagetype>
<binary>
  <inputid>1</inputid>
  <inputname>Door</inputname>
  <event>E</event>
</binary>
<extpwr>0</extpwr>
```

The <event> value is “E,” meaning that the Door sensor was the cause of the Event message. The <extpwr> value is 0, which means that the Mobile Terminal is operating on its internal battery.

Note that for the Door sensor, the optional <inputval>, <inputstate> and <timeofreading> elements are not included.

Example 2: If an Event occurs on Input 1 (sensor name = “Door”) while another Event is already running on External Power (sensor name = “Tether”), the following is returned:

```
<messagetype>Event</messagetype>
<binary>
  <inputid>1</inputid>
  <inputname>Door</inputname>
  <event>E</event>
</binary>
<binary>
  <inputid>15</inputid>
  <inputname>Tether</inputname>
  <event>R</event>
</binary>
<extpwr>1</extpwr>
```

The <event> value for the Door sensor is “E,” meaning that the Door sensor was the cause of the Event. The <event> value for the Tether sensor is “R,” meaning that a Tether Event has caused additional transmissions (called event “responses”) since the external power input changed state (this is a sensor configuration option). The <extpwr> value is 1, which means that the Mobile Terminal is now operating on an external power source (e.g. tractor power).

Note that for the Tether sensor the input has a reserved ID (15) and the optional <inputval>, <inputstate> and <timeofreading> elements are not included. The <extpwr> element contains the power source of the Mobile Terminal at the time of the transmission.

Example 3: If an Event occurs on Input 2 (sensor name = “Motion”), the following is returned:

```
<messagetype>Event</messagetype>
<binary>
  <inputid>2</inputid>
  <inputname>Motion</inputname>
```

---

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```

<inputval>1</inputval>
<inputstate>Start</inputstate>
<timeofreading>2005/02/26 12:24:07</timeofreading>
<event>E</event>
</binary>
<extpwr>0</extpwr>

```

The <event> value for the Motion sensor is “E,” meaning that the Motion sensor was the cause of the Event. The <extpwr> value is 0, which means that the Mobile Terminal is operating on its internal battery.

Note that for the Motion sensor, the optional <inputval>, <inputstate> and <timeofreading> elements are included. The <inputval> element denotes the binary state of the sensor and is either ‘0’ or ‘1’. The <inputstate> element contains a value of ‘Start’ meaning that the message is a “Motion Start” Event. If the <inputstate> value had been ‘Stop’, the message would have been a “Motion Stop” Event. The <timeofreading> element contains the time stamp (relative to the GMT time zone) that the Motion sensor was triggered, which always precedes the <time> of transmission of the Event.

Example 4: If a Scheduled Report occurs while there is an active Motion sensor on Input 2, the following is returned:

```

<messagetype>Scheduled</messagetype>
<binary>
  <inputid>2</inputid>
  <inputname>Motion</inputname>
  <inputval>0</inputval>
  <inputstate>Stopped</inputstate>
</binary>
<extpwr>0</extpwr>

```

In this example, the <event> element is not included, since the message type is a Scheduled Report. The <extpwr> value is 0, which means that the Mobile Terminal is operating on its internal battery.

Note that for the Motion sensor, the optional <inputval>, <inputstate> elements is included. The <inputval> element denotes the binary state of the sensor and is either ‘0’ or ‘1’. The <inputstate> is a label assigned by Customer Care to reflect the combination of <event> and <inputval>. The <inputstate> element contains a value of ‘Stopped’ meaning that the asset was “Idle” at the time of the Scheduled Report. If the <inputstate> value had been ‘Moving’, the asset would have been “Moving.” The <timeofreading> element is not included because the message type is a Scheduled Report.

Note: If no binary sensors such as Door, Motion or Tether are set up in the configuration of the Mobile Terminal, no <binary> elements will be included in the XML document for that MT.

The table below lists some common data values for binary sensors.

Note: All these elements are data driven and the customer can choose to use custom terms for inputname and/or inputstates. The data is not limited to these values.

Inputid	Inputname	Message	InputVal	Inputstate
---------	-----------	---------	----------	------------

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		Type		[ User configurable Label for Binary sensor states ] Typically used to tell the 'Event' apart from the 'Response' state.
1	Door	Event	1/0	Open/Closed
1	Door	Non-Event (e.g., Scheduled with sensor status )	1/0	Open/Closed
2(or 3)	Motion	Event	1/0	Start/Stop
2(or 3)	Motion	Non-Event (e.g., Scheduled with sensor status )	1/0	Moving/Stopped(or Idle)
15	Ext (External Power)	Event	1/0	Tether/Untether
15	Ext (External Power)	Non-Event (e.g., Scheduled with sensor status )	1/0	Tethered/Untethered
15	Tether		1/0	External Power/Internal Battery
1 (or 2)	Light	Event	1/0	On/Off
1 (or 2)	Light	Non-Event	1/0	Lit/Dark
1 (or 2)	Container Detection	Event	1/0	Mounted/Dismounted
1 (or 2)	Container Detection	Non-Event	1/0	Mounted/Bare

Field 6: <serial> </serial> - these tags enclose serial device identifiers and data within each GLS data set and are only present if the Mobile Terminal has been configured with at least one attached serial device. See Appendix A for a list of common serial devices. There can be up to 6 serial devices configured on the Mobile Terminal's RS-485 bus. Each configured device will have its own set of <serial> information.

Example 1: If an Event occurs on Serial Device 0 (sensor name = "Cargo"), the following is returned:

```

<messagetype>Event</messagetype>
<extpwr>1</extpwr>
<serial>
  <serialtype>1</serialtype>
  <serialid>0</serialid>
  <serialname>Cargo</serialname>
  <serialdata>Loaded</serialdata>
  <timeofreading>2005/02/26 12:24:07</timeofreading>
  <event>E</event>

```

---

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`</serial>`

The `<serial>` tag encloses the serial device type, ID and name, as well as the serial data. The SkyBitz Cargo Sensor has a reserved device type of 1.

The `<event>` value for the Cargo sensor is “E,” meaning that the Cargo sensor changing state was the cause of the Event. The `<extpwr>` value is 1, which means that the Mobile Terminal is operating on an external power source (e.g. an auxiliary battery pack).

At the time of the Cargo sensor Event, a load status change from “Empty” to “Loaded” was detected.

Example 2: If a Scheduled Report occurs while there is an active Cargo sensor on Serial Device 0, the following is returned:

```
<messagetype>Scheduled</messagetype>
<extpwr>0</extpwr>
<serial>
  <serialtype>1</serialtype>
  <serialid>0</serialid>
  <serialname>Cargo</serialname>
  <serialdata>Empty</serialdata>
</serial>
```

In this example, the `<event>` element is not included, since the message type is a Scheduled Report. The `<extpwr>` value is 0, which means that the Mobile Terminal is operating on its internal battery. At the time of the Scheduled Report, the load status reading from the Cargo sensor was “Empty.”

**Note:** If no serial devices such as the Cargo sensor are set up in the configuration of the Mobile Terminal, the `<serial>` tag set will not be included in the XML response for that MT.

- Field 7:** `<landmark> </landmark>` - these tags enclose data for points of interest (e.g. a customer facility or a major population center) within each GLS data set and are only present if the SkyBitz SOC was able to solve the position of the Mobile Terminal and a population center or customer landmark is in close proximity to the latitude and longitude of the MT’s position.
- Field 8:** `<address></address>` - these tags enclose the address for the location and are only present when the Mobile Terminal reports at a custom landmark or the account is setup to include POI ( points of interest ) address close to the MT’s position. In future, MT positions at generic landmarks might include this information.
- Field 9:** `<skyfence></skyfence>` - these tags enclose details about the Asset’s skyfence arrival, departure and skyfence status. Skyfences must be defined in the account (circular landmarks marked as a skyfence or a multipoint landmark) before the location details can reflect arrival/departure at skyfences.
- Field 10:** `<idle> </idle>` - these tags enclose data summarizing the idle status of the asset and are only present when the most recent position of the asset is retrieved.
- Field 11:** `<profile> </profile>` - these tags enclose data summarizing profile information for the Mobile Terminal. Profiles define the network configuration of each Mobile Terminal. Most Mobile Terminals have 2 profiles, a “Reporting” profile defining the number of times per day it transmits a scheduled report, and a “Wake Up” profile defining the sleep interval between reception of commands relayed by the SkyBitz gateway (e.g. paging requests).

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Field 12: <ats></ats> - these tags enclose location description using the Alberta Township System of coordinates. The tags enclose the following string elements.

lsd - string(4) - numeric or "n/a" (e.g.  
meridian - string (4) - alphanumeric ( e.g. W 4 )  
township - string (4) - numeric or "n/a"  
range - string (4) - numeric or "n/a"  
section - string (4)- numeric or "n/a"

Field 13: <reeferstate> </reeferstate> - these tags enclose the Reefer Status when the device installed on the asset is a Refrigeration monitoring device. Reefer State includes the reefer controller state, the operating temperatures, engine hours and other peripheral sensor states attached to this device.

Field 14: <reeferalarmstatus></reeferalarmstatus> - these tags denote the alarm status of the reefer at the time of the message.

Field 15: <reeferalarm></reeferalarm - these tags provide the manufacturer specific alarm codes and active status indication when alarms are detected by the reefer controller.

Field 16: <checkstatus></checkstatus> - these tags provide a unique transid that is expected to be acknowledged by the client in the HTTP response. This message is used to determine status of the registered client.

Field 17: <mileage></mileage> - these tags provide an Asset's mileage data for the lookup criteria. It is a composite tag that include details of the asset and all the mileage information during the lookup period.

Field 18: <mileagedetails></mileagedetails> - these tags primarily contain the mileage date and the mileage value as of the mileage date .

Field 19: <totalmileage></totalmileage> - these tags contain the latest virtual odometer reading (total device mileage ) for the mobile terminals matching input criteria. Empty tags will be sent for mobile terminals that do not have a value for this attribute.

Field 20: <locationids></locationids> - these tags contain one or more location\_id tags denoting location IDs associated with the landmark as alternate identifiers. Each location id must be unique within the customer account. The primary locationid will also be presented in this list.

Field 21: <container></container> - these tags contain details about the Container associated with the asset.

### 3.1.2 Simple XML tags (PCDATA)

Field 22: <error> </error> - these tags are always present in every SkyBitz XML interface response and enclose the error code value in response to a command. If there are no errors, the value returned is "0".

Error codes are:

0 = No error

1 = Invalid login credentials

2 = Invalid or missing Mobile Terminal Serial Number or Asset ID

3 = Invalid Asset ID range

4 = Invalid timestamp format

5 = Invalid timestamp range

7 = No active Page Request to be cancelled

8 = Page Request for Mobile Terminal already in progress

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- 9 = No XML access privilege for user account
- 10 = Invalid or missing "pagecmd" parameter
- 11 = Mobile Terminal not in service
- 12 = No privilege for command
- 13 = Mobile Terminal already in requested Panic Mode state
- 14 = Invalid or missing Panic Mode status parameter
- 15 = Invalid Group parameter or no permission to access the Group
- 16 = Maximum date/time range of 24 hours when retrieving position history of multiple Mobile Terminals
- 18 = Invalid Action User Name
- 19 = Action not supported for Simplex Device
- 20 = Invalid Panic Duration Parameter
- 21 = Inactive MT or No active configuration found for MT
- 50 = Invalid or missing "listtype" parameter
- 51 = No privilege to view profiles
- 52 = No privilege to change profiles
- 53 = Invalid or missing "profileid" parameter
- 54 = Invalid or missing profile number
- 55 = Invalid or missing profile duration
- 56 = Change profile command failed
- 57 = Maximum custom paging profiles reached
- 58 = Maximum custom reporting profiles reached
- 59 = Profile to be cancelled does not exist
- 60 = Custom profile of the same type already exists
- 70 = Invalid or missing "actiontype" parameter
- 71 = mtsn not valid for asset on date specified
- 72 = Invalid asset for mtsn
- 73 = Invalid or missing new assetid
- 74= Invalid or missing new mtsn
- 75= Invalid Asset Type
- 76= Invalid of missing Action Date
- 77= Invalid or missing new asset type
- 78=Action causes MT to belong to multiple Assets simultaneously
- 79=Action causes multiple MTs to be on an asset simultaneously
- 80=Invalid or missing Asset ID
- 81=Invalid Asset Note
- 82=Conflicting pending request for Asset Configuration found
- 83=Invalid value for RMA Ind ( enter 'y' or 'n')
- 84=Missing one or more Key Value(s) in a formatted asset note input
- 85=Missing one or more Key Name(s) in a formatted asset note input
  
- 92 = Mobile Terminal not registered on network
- 93 = Maximum number of pending profile changes reached
- 94 = Maximum number of Page Requests already in progress
- 95 = Maximum number of Panic Mode requests already in progress
- 96 = XML request already in progress from same user
- 97 = XML interface command queue is full
- 98 = XML interface maintenance in progress
- 99 = XML interface halted
- 102=Invalid Request Format ( xml not formatted properly )
- 103=No User(s) in Group
- 104=No Asset(s) in Group
- 105=Missing Group Name
- 106=Duplicate Group Name

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107=Invalid Group Name  
108=Group Name Must be less than 30 characters long  
109=Missing User Name(s)  
110=Invalid User Name(s)  
111=Missing AssetID(s)  
112=Invalid AssetID  
113=Number of groups in the account exceeded limit  
114=XML Interface experiencing heavy usage from client  
115=Input XML Request exceeds size limit  
116=Actions allowed per request exceeded limit  
117=Groups Management Privilege required to perform this operation  
118=Invalid DTTS Setup ( Need Customer Care to setup account )  
119=No privileges to perform DTTS setup functions  
120=Customer SCAC missing to apply DTTS Setup  
121=Invalid motionstate parameter value  
122=Invalid profilereplacementchoice  
123=Invalid speedviolationthreshold  
124=Invalid speedviolationduration  
  
125=Invalid speedviolationthreshold Limit  
  
126=Invalid speedviolationduration Limit  
  
127=Required speedviolationthreshold  
128=Required speedviolationduration  
129=Product does not support Speed Violation Threshold setup

See Section 7 ( Error Codes ) for full listing and details.

Field 23: <mtsn> </mtsn> - these tags are always present in every GLS data set and contain the case sensitive 25 character Mobile Terminal Serial Number.

Field 24: <devicetype></devicetype> -these tags are always present in every GLS data set and denote the type of the mobile terminal. The valid values for this tag are

GLS  
GXS  
GXT100  
Refrigeration  
GXT  
GXT2000  
GXT3000  
GXT3100  
GST  
GTP  
GXT2000

Field 25: <assetid> </assetid> - these tags are always present within each asset element and contain the case sensitive Asset ID (can be up to 20 characters) associated with the Mobile Terminal after installation (e.g. your trailer number). If the Mobile Terminal has not yet been installed,

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its Asset ID will be "n/a". If the Mobile Terminal has been opera yet been installed, its Asset ID will be "n/a". Asset ID is alphanumeric and may include '-' ( hyphen) and underscore(\_) after the first Character.No other special characters (including spaces ) are allowed in an Asset ID.

- Field 26: <tractorid></tractorid> - these tags contain the tractor id and will be present for Assets equipped with Smart Sensor tracking Mobile Terminals and PLC tractor id reader. The data will appear on motion start events. The tag is available from version>=2.55
- Field 27: <assettype> </assettype> - these tags are always present within each asset element and contain optional information about the type of asset (e.g. Semi-Trailer, Tractor, Reefer, Railcar, Fixed Site Monitor) that a Mobile Terminal is installed on.
- Field 28: <owner> </owner> - these tags are always present within each asset element and contain a string of up to 40 characters that uniquely identifies the company that owns the asset (e.g. "ABC Trucking, Inc.").
- Field 29: <note></note> - these tags are optionally present within each asset element and contain a string of up to 256 characters.
- Field 30: <groupname></groupname> - these tags are present within the <groups> element and denote the Group to which the asset is a member. An asset may belong to multiple groups at a point in time.
- Field 31: <messagetype> </messagetype> - these tags enclose the message type (valid values are "Scheduled", "Paging Response", "Priority", "Event" and "Violation" , Optionally [Route Violation]' may be appended to some of these values when the MT was supposed to be within a route and the system detected a violation

Additionally for Reefer Monitoring devices <messagetype> may include values -"BEGIN MOVE","BURN-IN STATUS REPORT","DATAGATE IN SERVICE","DOOR CLOSE","DOOR OPEN","END OF MOVE","HEARTBEAT","POWER CHANGE","REEFER ALARM","REEFER PROFILE-INTELLISET","REMOTE STATUS REPORT","SETPOINT CHANGED","STATUS REPORT".

- Field 32: <inputid> - these tags enclose a numeric Identifier for the binary sensor. Depending on the type of the product, the inputid can take various numeric values. In most cases it reflects the physical I/O pin.
- Field 33: <inputname> - these tags enclose the sensor name assigned to it based on the sensor kind. Typical values are 'Door', 'Motion' , 'Light' etc.
- Field 34: <inputval> - these tags enclose the binary state of the sensor switch – 0 or 1 are the only possible values for this element. E.g., 0- Stop; 1- Start for a Motion sensor <inputstate> - these tags enclose a customized label assigned to the <inputval> and <event> combinations. E.g., For a 'Motion' sensor , <inputval>0</inputval> when the <event>E</event> the <inputstate> is set to 'Start', if the <event> is an 'R' , the <inputstate> is set to 'Moving'. The inputstate labels are configurable by customer, sensor and <event> granularity.
- Field 35: <timeofreading> - these optional tags enclose the time at which the sensor event fired. , These tags enclose the UTC timestamp of the event data .
- Field 36: <event> - optional tags that enclose additional information to assist in interpretation of the <inputval>. If the message transmission is the actual event triggered by the sensor firing off the event, <event> will be set to 'E', else it will be set to 'R'.
- Field 37: <extpwr> </extpwr> - these tags enclose the state of the external power pin of the Mobile Terminal I/O (valid values are "0" for internal battery only and "1" for external power available)

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Field 38: <serialtype> </serialtype> - these tags enclose the type of serial device connected to the RS-485 bus of the Mobile Terminal I/O port (a Cargo sensor has a reserved device type of 1, a Motion Sensor has a reserved device type of 2)

Field 39: <serialid> </serialid> - these tags enclose the serial Device ID number connected to the RS-485 bus of the Mobile Terminal I/O port (the bus can support up to 6 connected devices, with the Cargo sensor usually having a Device ID number equal to 0)

Field 40: <serialname> </serialname> - these tags enclose the customer definable name associated with a serial device connected to the RS-485 bus of the Mobile Terminal I/O port (a Cargo sensor will usually have “Cargo” as the device name)

Field 41: <serialdata> </serialdata> - these tags enclose the data sent by a serial device connected to the RS-485 bus of the Mobile Terminal I/O port

In the case of the SkyBitz Cargo sensor, the <serialdata> field contains the load status of the trailer or container at the time of the Mobile Terminal transmission.

The Cargo sensor records 2 data values, **current load status** and **filtered load status**. The Cargo sensor always reports the filtered load status, as well as an indicator as to whether the filtered load status is transitioning from empty to full or full to empty. The Cargo sensor requires consecutive load status readings in order to confirm a load status change before reporting a new “filtered” status. The number of readings and time interval for confirmation of filtered load status is configurable over the air. The Cargo sensor performs filtering to provide the best load status accuracy.

The load status value can be one of the following:

**Empty** – the load status is confirmed to be empty by the Cargo sensor.

**Loaded** – the load status is confirmed to be loaded by the Cargo sensor.

**(Empty)** – the Cargo sensor has detected that the trailer or container load status has transitioned from empty to loaded. The (brackets) around the load status value indicate that this value will change to “Loaded” if additional consecutive load status readings all return a value of “Loaded”.

**(Loaded)** – the Cargo sensor has detected that the trailer or container load status has transitioned from loaded to empty. The (brackets) around the load status value indicate that this value will change to “Empty” if additional consecutive load status readings all return a value of “Empty”.

**In Transition** – the Cargo sensor has detected the load status is changing although it cannot confirm loaded/empty. This value should occur rarely.

**Undetermined** – the Cargo sensor is unable to detect the load status of the trailer or container. This value should rarely occur.

**Error** – a Cargo sensor error has occurred. This value should never occur with a normally operating sensor. Any Cargo sensors that repeatedly return this load status value should be replaced.

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**Disabled** – the Mobile Terminal is not configured to communicate with a Cargo sensor. The SkyBitz Network Administrator can configure a Cargo sensor assignment for a Mobile Terminal over the air.

**No answer** – the Mobile Terminal is configured to communicate with a Cargo sensor, but the sensor is not replying when queried. If this value occurs, it is likely that the cabling and Mobile Terminal Interface Module (MTIM) battery that powers the Cargo sensor need to be checked.

Field 42: <latitude> </latitude> - these tags enclose the decimal latitude value of the position (positive values for latitude are north of the Equator, negative values are south of the Equator)

Field 43: <longitude> </longitude> - these tags enclose the decimal longitude of the position (positive values for longitude are east of the Prime Meridian, negative values are west of the Prime Meridian)

Field 44: <speed></speed> - these tags enclose the speed reported in miles per hour. This tag is only optionally present for devices capable of reporting travel speed information.

Field 45: <heading></heading> - the direction in which the asset is moving. "NE", "NW" etc.

Field 46: <headinginddegrees></headinginddegrees> - the direction in which the asset is moving represented in degrees . 0 degrees represents North . Degrees range from 0 to 360 in clockwise direction.

Field 47: <journeydistance></journeydistance> - the distance travelled by the asset since the start of the current trip. The units of distance are in KM.

Field 48: <totaldevicemileage></totaldevicemileage>- these tags include the total mileage accumulated by the mobile terminal over its lifetime. The units of distance are in KM. Additional configuration is required on the device to obtain this data from the device. Messaging costs might apply to enable this facility. To determine whether your tracking product supports this facility and how to enable the feature, please contact your SkyBitz Customer representative.

Field 49: <temperaturecelsius></temperaturecelsius>- these tags include the temperature reading in degrees Celsius.

Field 50: <temperaturefahrenheit></temperaturefahrenheit> - these tags include the temperature reading in degrees Fahrenheit.

Field 51: <battery> </battery> - these tags enclose the status of the internal battery of the Mobile Terminal (values are "OK", "LOW" and "EXT"), so the customer can get advanced notice that the battery will need replacement soon or if the Mobile Terminal is powered by an external power source.

Field 52: <time> </time> - as part of the <gls> element, these tags enclose the UTC timestamp of the position data As part of the <profile> element, these tags enclose the UTC timestamp of the creation of the profile . Format is YYYY/MM/DD HH24:MI:SS, interpreted as year month day hour minute second.

**Note: Each <gls> message is uniquely identified by a combination of its Mobile Terminal Serial Number (S/N) <mtsn> and UTC timestamp <time> elements.**

Field 53: <quality> </quality> - these tags enclose a SkyBitz code that indicates the relative precision the GLS solution for position (valid values are 0 = Excellent, 1 = Good, 2 = Fair), where an

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Excellent GLS solution is usually accurate to 15 meters (50 feet) from the true position of the Mobile Terminal

Field 54: <geoname> </geoname> - these tags enclose the geographic name (up to a 40 character string) of the closest landmark to the GLS position of the Mobile Terminal. The tags will include the nested landmark name when the closest landmark has nested landmarks defined within it's boundary.

Field 55: <locationid></locationid> - these tags enclose an alternative identifier (alphanumeric up to 45 characters long) for the landmark identified by <geoname>. The locationid is an optional attribute for a landmark. This represents the 'primary' location ID of the landmark , when present within the <landmark> tags. The locationid is truncated to 14 characters for customers integrating with the Biztalk integration SOAP service.

Field 56: <street></street> - these tags enclose the house number and street of the location address and optionally present in the GLS

Field 57: <city></city> - these tags enclose the city name of the closest landmark to the GLS position of the Mobile Terminal. ( version=2.54 and above )

Field 58: <state> </state> - these tags enclose the state or province abbreviation (up to 3 characters) of the closest landmark to the GLS position of the Mobile Terminal (e.g. VA, ON, TAM).

Field 59: <country> </country> - these tags enclose the IANA country code (2 characters) of the closest landmark to the GLS position of the Mobile Terminal (e.g. US, CA, MX).

Field 60: <postal></postal> - these tags enclose the postal (zip cose) of the address of the GLS Position of the Mobile terminal.

Field 61: <geoshape></geoshape> - these tags enclose the landmark outline shape. The possible values in these tags are "Circular" and "Multi-Point" and denote whether the landmark outline denotes a circle or a polygon..

Field 62: <distance> </distance> - these tags enclose the straight-line distance (in statute miles) between the closest landmark and the GLS position of the Mobile Terminal.

Field 63: <direction> </direction> - these tags enclose the approximate straight-line direction from the position of the closest landmark to the GLS position of the Mobile Terminal (e.g. "NE") .

Field 64: <geotypename></geotypename> - these tags enclose the string value for the landmark type. If a city/town was found for the landmark instead of customer landmark, it will contain the value '**GENERIC**' . **This tag will be present for requests for version 2.50 and higher.**

**[Refer to Insight for the complete list of supported landmark types. The 'landmark type' drop-down list on the ' Add Landmark' Feature lists all possible values for this field.]**

Some values are:

**Automotive**  
**GENERIC**  
**None**  
**Port of Entry(Customs)**  
**Rail**  
**Receiver**

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**Rest Stop  
Service Center  
Shipper  
Supplier  
Yard...**

- Field 65: <idlestatus> </idlestatus> - these tags enclose a status of "Idle" or "Moving." The asset is "Idle" if it has moved less than 1 kilometer from its idle position. The asset is "Moving" if it has moved greater than or equal to 1 kilometer from its idle position.
- Field 66: <idleduration> </idleduration> - these tags enclose the number of days an asset has been "Idle" and are only present if the <idlestatus> value is "Idle." Durations of less than 1 day are shown as a decimal fraction.
- Field 67: <idlegap> </idlegap> - these tags enclose the maximum number of days between two successive positions while the asset's <idlestatus> value is "Idle." The larger the <idlegap> value, the greater the probability that the asset could have departed from and returned to its idle position between two successive GLS positions. Idle gap values less than 1 day are shown as a decimal fraction.
- Field 68: <epmflag></epmflag> - these tags enclose the a value to indicate whether the MT has EPM attached to it at the time of the observation. 0 indicates the MT has no EPM and 1 indicates the MT has EPM as of the time of the position report.
- Field 69: <ehmeter></ehmeter> - these tags enclose the Engine Hour Meter reading reported from the Unit. Customers with engine hour meters attached to the MT, the meter reading can be looked up from XML version=2.51 and above. The value is a string that denotes the meter reading. It may also contain 'n/a' and the meter reading will be marked with an asterisk (\*) to denote uncalibrated reading.
- Field 70: <ehcounter></ehcounter> - these tags enclose the Engine Hour Counter reading reported from the Unit. Customers with engine hour meters attached to the MT, the meter reading can be looked up from XML version=2.51 and above. The value is a string that denotes the hour counter reading. It contains 'n/a' for entries that have no hour counter reading.
- Field 71:
- Field 72: <ats></ats> - these tags enclose the Alberta Township System coordinates to indicate location
- Field 73: <profiletype> </profiletype> - these tags enclose the type of profile making up the network configuration of the Mobile Terminal. Current profile type values are "Reporting" and "Wake Up." A "Reporting" profile defines how many times per day a Mobile Terminal will transmit its GLS position. A "Wake Up" profile defines the sleep time between reception of commands from the SkyBitz gateway (e.g. pages)
- Field 74: <profilenum> </profilenum> these tags enclose the profile number, which defines the frequency of wake ups or scheduled reports for the profile. Each profile number is unique. Valid profile numbers are:

<profilenum> value	Profile Type and frequency
0001	1 report per day
0002	2 reports per day
0004	4 reports per day

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0006	6 reports per day
0012	12 reports per day
0022	22 reports per day
0045	45 reports per day
0090	90 reports per day
1004	6 hour wake up interval
1006	4 hour wake up interval
1012	2 hour wake up interval
1015	96 minute wake up interval
1022	64 minute wake up interval
1045	32 minute wake up interval
1090	16 minute wake up interval
2000	Fast Page

Field 75: <profileid> </profileid> - these tags enclose the profile identification, which can have the following values:

<profileid> value	Profile identification
Contracted	Profile is permanent and specified in the customer's service agreement
Custom Permanent	Profile is permanent and is not specified in the customer's service agreement
Custom Temporary	Profile is temporary (it will have an expiration date) and is not specified in the customer's service agreement
Panic Mode	Profile is temporary (it will have an expiration date) and is the result of a Panic Operation
Event Response	Profile is temporary (it will have an expiration date) and resulted from a Mobile Terminal Event

Field 76: <profilepwr> </profilepwr> - these tags enclose the power status of a Mobile Terminal profile, defining under what power source the profile is active. Valid <profilepwr> values are "Internal" (active on internal battery only), "External" (active on external power only) and "IntExt" (valid on either internal battery or external power)

Field 77: <profilestatus> </profilestatus> - these tags enclose the network status of a Mobile Terminal profile, which can have any of the following values:

<b>&lt;profilestatus&gt; value</b>	<b>Status description</b>
Active	Mobile Terminal is configured with the profile
Pending Add	SkyBitz Gateway is waiting for next Mobile Terminal Wake Up to allocate the profile
Pending Delete	SkyBitz Gateway is waiting for next Mobile Terminal Wake Up to command it to delete the profile
Suspended	SkyBitz Gateway has commanded the Mobile Terminal to suspend this profile while a temporary profile is active
Failed	SkyBitz Gateway was unable to allocate the profile (should rarely occur)

Field 78: <lastupdate> </lastupdate> - these tags enclose the UTC timestamp of the last status change of the profile . Format is YYYY/MM/DD HH24:MI:SS, interpreted as year month day hour minute second.

Field 79: <expiration> </expiration> - these tags enclose the UTC timestamp of the expiration of a temporary profile . Format is YYYY/MM/DD HH24:MI:SS, interpreted as year month day hour minute second.

Field 80: <nextaction> </nextaction> - these tags enclose the UTC timestamp of the next wake up of the Mobile Terminal on the profile (if active), so the user knows when a reply can be expected to a page . Format is YYYY/MM/DD HH24:MI:SS, interpreted as year month day hour minute second.

Field 81: <setup> </setup> - these tags enclose Customer setup definitions . e.g.,asset types

Field 82: <assettypedef></assettypedef> - these tags enclose the characteristics of an asset type. Assets can be identified to be of a specific type using the SkyBitz Insight. This compound element describes all the details of the asset type

Field 83: <assettype></assettype> - these tags enclose the name of the customer defined asset type

Field 84: <assettypebase></assettypebase> - these tags enclose the name of the generic asset type that was used to create a custom asset type definition

Field 85: < assettypeattr></ assettypeattr> - these tags within the asset type definition refer an attribute of the asset type

Field 86: < assettypeattrname ></ assettypeattrname > - these tags within the asset type definition refer to the name of an asset type attribute e.g, rooftype

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- Field 87: <assetypeattrval ></ assetypeattrval > - these tags within the asset type definition refer to the value of an asset type attribute. E.g. Aluminium, Translucent etc
- Field 88: <note> </note> - these tags contain any comments/notes of the enclosing entity
- Field 89: <reefermake></reefermake> - denotes the make of the reefer.  
Possible values are 'Carrier', 'ThermoKing'.
- Field 90: <interfacetyp></interfacetyp> – denotes the type of reefer controller interface.  
Possible values are 'Standard', 'Advanced', 'SR2', 'iBox', 'MPT', 'MP' and so on.
- Field 91: <contenttype></contenttype>– denotes the type of message sent.  
Possible values are 'Standard', 'Condensed'
- Field 92: <controlleron></controlleron>– This is a 'true' or 'false' value denoting whether the controller is on
- Field 93: <fuelpercent></fuelpercent>– denotes the percentage of Fuel remaining in the refrigeration unit
- Field 94: <assetbatteryvoltage></assetbatteryvoltage>– denotes the battery voltage of the refrigeration unit.
- Field 95: <engineon></engineon>– This is a 'true' or 'false' value denoting whether the engine is on.
- Field 96: <enginemode></enginemode>– denotes the run mode of the Engine.  
Possible values are 'Continuous', 'Start/Stop'
- Field 97: <enginesize></enginesize>– denotes the size of the engine. Numeric value between 0 and 8
- Field 98: <enginespeed></enginespeed>– denotes the engine speed.  
Possible values are 'Low', 'High'
- Field 99: <engineerunhours></engineerunhours>– denotes the Engine Run time in hours
- Field 100: <engineswitchonhours></engineswitchonhours>– denotes the Engine Switch on hours
- Field 101: <enginestandbyhours></enginestandbyhours>– denotes Engine Standby hours
- Field 102: <reeferoperatingstatus></reeferoperatingstatus>– denotes Operating status of the refrigeration unit.  
Possible values , that vary based on reefer make/interface type are 'Alarm Shutdown', ' Start/Stop Off Cycle', ' Sleep Mode Off', 'On', ' PC Mode', ' Config Mode', ' Data Recorder', 'Idle', ' Continuous', ' Cycle Sentry',
- Field 103: reeferalarmtype – denotes the type of alarm. Possible values are 'Critical', ' Non-Critical'
- Field 104: alarmid – denotes the alarm code of the alarm
- Field 105: alarmactive – This is a 'true' or 'false' value to denote whether the alarm is active or inactive
- Field 106: activeprofileslotnumber – denotes the slot number ( 0- 31) for active profile setting
- Field 107: ambienttemperature – denotes the ambient temperature in deg. Celsius
- Field 108: modezone1 – denotes the operating mode of Zone 1 .  
Possible values are 'Unit Off', 'Heating', 'Disabled', 'Cooling', 'Idle', 'Defrost', 'Sentry', 'Pre-trip', 'ManuSpecific', 'Alarm Shutdown' etc.
- Field 109: <setpointtemperaturezone1></setpointtemperaturezone1>– denotes the Setpoint temperature in degrees Celsius
- Field 110: <supplyairtemperaturezone1></supplyairtemperaturezone1>– denotes the Supply Air Temperature in degrees Celsius
- Field 111: <returnairtemperaturezone1></returnairtemperaturezone1>– denotes the Return Air Temperature in degrees Celsius
- Field 112: <modezone2></modezone2>– denotes the operating mode of Zone 2. Refer to Zone 1 description for possible values.
- Field 113: <setpointtemperaturezone2 ></setpointtemperaturezone2 >- Set point temperature for Zone 2 in deg Celsius
- Field 114: <returnairtemperaturezone2></returnairtemperaturezone2>– Return air temperature for Zone 2 in deg Celsius

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- Field 115: <modezone3></modezone3>– denotes the operating mode of Zone 3. Refer to Zone 1 description for possible values.
- Field 116: <setpointtemperaturezone3></setpointtemperaturezone3>– denotes set point temperature for Zone 3 in deg Celsius
- Field 117: <returnairtemperaturezone3></returnairtemperaturezone3>– denotes return air temperature for Zone 3 in deg Celsius
- Field 118: <reeferremotetemperaturesensor1></reeferremotetemperaturesensor1>– denotes remote temperature from additional sensors when the asset is configured with remote temperature probes.
- Field 119: <reeferremotetemperaturesensor2></reeferremotetemperaturesensor2>- denotes remote temperature from additional sensors when the asset is configured with remote temperature probes.
- Field 120: <reeferremotetemperaturesensor3></reeferremotetemperaturesensor3>- denotes remote temperature from additional sensors when the asset is configured with remote temperature probes.
- Field 121: <doorstateopen></doorstateopen>– This is a ‘true’ or ‘false’ value to denote door open state when the asset has a door sensor attached to the device
- Field 122: <doorswitchopen></doorswitchopen>- This is a ‘true’ or ‘false’ value to denote door switch state when the asset has a door sensor attached to the device
- Field 123: <remoteswitch1open></remoteswitch1open>– This is a ‘true’ or ‘false’ value to denote whether remote switch 1 is open
- Field 124: <remoteswitch2open></remoteswitch2open>- This is a ‘true’ or ‘false’ value to denote whether remote switch 2 is open
- Field 125: <transid></transid> - this is a unique identifier sent on Data Push Packets to the client. The acknowledgement to a location or profile change update must include the same identifier. This tag should be ignored in xml responses received on Data Poll Requests.
- Field 126: <mileageInMiles></mileageInMiles> - This denotes the journey distance of the asset in Miles. It is not a running total.
- Field 127: <mileageInKM></mileageInKM> - denotes the journey distance of the asset in KM.
- Field 128: <mileagedate></mileagedate>- The tag denotes the date on which the mileage was collected for the device.
- Field 129: <mileagecapable></mileagecapable> - This tag denotes whether the asset is equipped with an MT that is capable of sending or computing mileage.
- Field 130: <mileagesetupstatus></mileagesetupstatus> - This tag denotes whether the MT has been configured to send mileage details to the system.
- Field 131: <timestamp></timestamp> - this tag denotes the actual time the mileage was computed in the system.
- Field 132: <skyfencestatus></skyfencestatus> - this tag denotes whether the asset is within a user defined skyfence or not as of a given position report. A value of ‘In’ denotes the asset is within a skyfence as of the observation time. Possible values are ‘In’ , ‘n/a’ , “Lockdown Violation”, “Lockdown Compliance”. The last two values are only applicable when the Asset reports while it is in a lockdown status.
- Field 133: <departureskyfence></departureskyfence> - the tag contains the landmark name of the skyfence from which the Asset has departed as of the position report time
- Field 134: <arrivalskyfence></arrivalskyfence> - the tag contains the landmark name of the skyfence to which the Asset has arrived as of the position report time
- Field 135: <batchnum></batchnum> - these tags include a unique identifier for each xml output. It is only included in xml packets sent in a batch mode over a data push interface.
- Field 136: <departurelocationid></departurelocationid > - these tags enclose an alternative identifier (alphanumeric up to 45 characters long) for the landmark identified by <departureskyfence>. The locationid is an optional attribute for a landmark.
- Field 137: <arrivallocationid></arrivallocationid > - these tags enclose an alternative identifier (alphanumeric up to 45 characters long) for the landmark identified by <arrivalskyfence>. The locationid is an optional attribute for a landmark.

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- Field 138: <containerid></containerid> - 20 character Identifier for the container.
- Field 139: <containertype></containertype> - Container Type, example 40HC , 20GP etc.
- Field 140: <scac></scac>- 10 character SCAC
- Field 141: <truckingcompany></truckingcompany >- 50 character field denoting the name of the trucking company
- Field 142: <associateddtm></associateddtm> - The tags denote the date and time the container details were associated with the assetid.The format of the date time must match the pattern dd/mm/yy-yy-HH24:MI:SS example 07/Feb/2016-10:45:20. The timezone must be in UTC.
- Field 143: <messagereceivedtime></messagereceivedtime> - These tags are part of the <gls> element, these tags enclose the UTC timestamp of the actual time when the message was received in system. Format is YYYY/MM/DD HH24:MI:SS, interpreted as year month day hour minute second.
- Field 144: <acctid></acctid> - This tag is available only for specific leasing customers. It encloses the leasing company's account id of the customer to which the asset is currently leased.
- Field 145: <secondaryid></secondaryid> - This tag is available only for specific leasing customers. It encloses an alternate id for an asset, one that is unique to the customer to whom the asset is leased.
- Field 146: <agreementtype></agreementtype> - This tag is available only for specific leasing customers. It encloses the type of leasing arrangement currently in place for the asset. Possible values are "Rental" and "Lease".
- Field 147: <branchname></branchname> - This tag is available only for specific leasing customers. It encloses the name of leasing company's branch to which the asset is currently associated.

## 4 Data Pull

### 4.1 *Protocols*

The SkyBitz SOC provides GLS data to customer asset management systems based on a "Data Pull" model. It is up to the customer's asset management system to maintain a process that periodically sends commands to the interface to page/command Mobile Terminals and to query the SkyBitz SOC database for Mobile Terminal GLS positions. The current implementation for commands and queries makes use of specifically formatted HTTP GET statements. Responses to queries are returned by the SOC over HTTP in XML documents. The SkyBitz Document Type Definition (DTD) defines the XML document format.

### 4.2 *Querying for position and sensor information*

Note: The SkyBitz SOC will keep messages from a customer's Mobile Terminals for at least 90 days. Any data lost at the customer's facility that is less than 90 days old can be re-downloaded as needed from the SkyBitz SOC. Message records that are more than 90 days old will be removed from the SkyBitz SOC database and archived. All archives are backed up to tape or CD-ROM.

Note: The SkyBitz SOC database does not currently track which messages have been delivered to the customer through the XML interface using the "data pull" method. It is up to the customer's fleet management software system to use the unique combination of Mobile Terminal Serial Number and message timestamp to filter any messages downloaded that are already stored in the customer's database.

#### 4.2.1 *Query Structure*

---

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In order to query the SkyBitz SOC for information for Mobile Terminal position reports and sensor data, the following structure should be used:

`http://xml.skybitz.com:nnnn/QueryPositions?mtsn=[mtsn]&customer=[user_name]&password=[password]&from=[dd/mon/yyyy-hh:mm:ss]&to=[dd/mon/yyyy-hh:mm:ss]&version=[version]&sortby=[sortby]`

[mtsn] is the set of 25 character Serial Number(s) (case sensitive) for which data is requested. Valid values are:

- A single Serial Number (example: MTXA0NC0125201811)
- ALL (provides data for all Serial Numbers assigned to your account)

OR

`http://xml.skybitz.com:nnnn/QueryPositions?assetid=[assetid]&customer=[user_name]&password=[password]&from=[dd/mon/yyyy-hh:mm:ss]&to=[dd/mon/yyyy-hh:mm:ss]&version=[version] &sortby=[sortby]`

[assetid] - is the Asset ID string (case sensitive) of your asset for which position data is requested. Valid values are:

- A single Asset ID string (example: T123456)
- A range of Asset ID strings separated by a tilde "~" (example: T123456~T234567) Note: make sure that the starting Asset ID in the range precedes the ending Asset ID in alphabetical order
- ALL (provides data for all Asset IDs assigned to your account)

OR

`http://xml.skybitz.com:nnnn/QueryPositions?group=[group]&customer=[user_name]&password=[password]&from=[dd/mon/yyyy-hh:mm:ss]&to=[dd/mon/yyyy-hh:mm:ss]&version=[version]&sortby=[sortby]`

[group] - is the group name string (case sensitive) of a group of assets for which position data is requested. Valid values are:

- A group name string of up to 20 characters (example: 534nn, denoting a group containing all Asset IDs between 53400 and 53499)

[user\_name] - is your SkyBitz Username (case sensitive) that has access rights to the specified Mobile Terminal(s)

[password] - is your SkyBitz Password (example: track-it123)

dd - is the 2-digit day of the month (example: 11)

Mon - is the case sensitive 3-character month (valid values are: jan, feb, mar, apr, may, jun, jul, aug, sep, oct, nov, dec)

yyyy - is the 4-digit year (example: 2003)

hh – is the 2-digit hour of the day (valid values are between 0 and 23)

mm – is the 2-digit minutes value (valid values are between 0 and 59)

ss – is the 2-digit seconds value (valid values are between 0 and 59)

Be sure when specifying values for “from” and “to” that the former is older than the latter.

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NOTE: if the "from" and "to" fields are omitted, the XML interface will return the most recent position for the Serial Numbers or Asset IDs specified.

NOTE: the XML interface will interpret the "from" and "to" values as UTC (Co-ordinated Universal Time), which is EST North America + 5 hours.

[version] – is the version number of the SkyBitz XML implementation .

Version 2.53 change doesn't affect the format of the data sent out in an XML data pull request. It impacts the positions that will be part of the response for lookups based on time ranges ( i.e., using 'from' and 'to' date time in request ). This avoids the possibility of skipping positions that arrive very close to the 'from' or 'to' time in the request. The client process must handle duplicate records around the 'from' time when using version 2.53 and above.

[sortBy] - denotes the order in which the results must be sorted.  
The sortBy parameter can be set to

Sortby parameter value	Results ordering	Applicable for:
1	asset id ascending ,Observation Time descending order	Multi-asset position lookup
-1	assert id descending , observation time ascending order	Multi-asset position lookup
2	Observation time descending order	Single asset position lookup
-2	Observation time ascending order	Single asset position lookup

#### 4.2.2 Query for Position History of a Single Asset or Mobile Terminal

Here are examples of requests for position data with a Username of "ABCTrucks" and Password of "track-it123".

To retrieve position reports for Serial Number "MTXA0NC0125201811" from midnight on the 20<sup>th</sup> of January, 2003 to midnight on the 21<sup>st</sup> of January, 2003 (all positions for a 24 hour period):

[http://xml.skybitz.com:nnnn/QueryPositions?mtsn=MTXA0NC0125201811&customer=ABCTrucks&password=track-it123&from=20/jan/2003-00:00:00&to=21/jan/2003-00:00:00&version=\[version\]&sortBy=\[sortBy\]](http://xml.skybitz.com:nnnn/QueryPositions?mtsn=MTXA0NC0125201811&customer=ABCTrucks&password=track-it123&from=20/jan/2003-00:00:00&to=21/jan/2003-00:00:00&version=[version]&sortBy=[sortBy])

#### 4.2.3 Query for Position History of a Range of Assets or Mobile Terminals

To retrieve position reports for Asset IDs between 639700 and 639799 from 6 AM on the 20<sup>th</sup> of January, 2003 to 7 AM on the 20<sup>th</sup> of January, 2003 (all positions for 100 assets over a 1 hour period):

[http://xml.skybitz.com:nnnn/QueryPositions?assetid=639700-639799&customer=ABCTrucks&password=track-it123&from=20/jan/2003-11:00:00&to=20/jan/2003-12:00:00&version=\[version\]&sortBy=\[sortBy\]](http://xml.skybitz.com:nnnn/QueryPositions?assetid=639700-639799&customer=ABCTrucks&password=track-it123&from=20/jan/2003-11:00:00&to=20/jan/2003-12:00:00&version=[version]&sortBy=[sortBy])

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This API can be used to retrieve history of position reports of All Assets in the account within a given date/time range. SkyBitz recommends that customers use this API call to receive location updates with minimal latency and avoid duplicates.

[http://xml.skybitz.com:nnnn/QueryPositions?assetid=All&customer=ABCTrucks&password=track-it123&from=20/jan/2003-11:00:00&to=20/jan/2003-12:00:00&version=\[version\]&sortby=\[sortby\]](http://xml.skybitz.com:nnnn/QueryPositions?assetid=All&customer=ABCTrucks&password=track-it123&from=20/jan/2003-11:00:00&to=20/jan/2003-12:00:00&version=[version]&sortby=[sortby])

The above request will return all position reports for the account in the 1 hour date/time range specified by the 'from' and 'to' parameters.

All Position reports **received** by SkyBitz SOC in the specified date/time range will be included in the response. Note that the date/time range doesn't apply to the time the message was queued on the Mobile Terminal. This approach allows customers to receive location updates for all their devices without losing even the messages transmitted by Assets that might have gone out of network but queued messages during the time they were out of network.

The interval between polling should equal the date/time range interval used to perform the lookup. Example, if polling every hour, the date/time range must also be an hour. It is not expected to poll every hour for hours of data. Doing so will result in excessive duplication of data in the response and overload every request and should not be used as a mechanism to poll for old data.

To reduce latency, customers may poll for locations frequently as often as every 1 hour, 30 minutes, 15 minutes or even 5 minutes.

**Note:** the maximum interval between the "from" and "to" time parameters is 24 hours when a range (of Asset IDs or Serial Numbers), a group name or the "ALL" parameter is specified for retrieval of the position history of multiple units.

**In the event where there is a need to catch up for data beyond 24 hours, the client program may issue successive requests of 24 hours date/time range issued 5-10 minutes apart.**

#### 4.2.4 Query for Most Recent Position of a Group

To retrieve the most recent position report for a group of Asset IDs, a valid group name must be specified and the user must have permission to access the group:

[http://xml.skybitz.com:nnnn/QueryPositions?group=534nn&customer=ABCTrucks&password=track-it123&version=\[version\]](http://xml.skybitz.com:nnnn/QueryPositions?group=534nn&customer=ABCTrucks&password=track-it123&version=[version])

**Note:** your user name must have been granted permission to access the group.

#### 4.2.5 Query for Most Recent Position of All Assets

To retrieve the most recent position report for all Asset IDs:

[http://xml.skybitz.com:nnnn/QueryPositions?assetid=ALL&customer=ABCTrucks&password=track-it123&version=\[version\] \]&sortby=\[sortBy\]](http://xml.skybitz.com:nnnn/QueryPositions?assetid=ALL&customer=ABCTrucks&password=track-it123&version=[version] ]&sortby=[sortBy])

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#### 4.2.6 QueryPositions Response XML Document

The format of the data returned is an XML document that can be validated using the SkyBitz XML Document Type Definition (DTD). The XML tags in the document are populated with data from the SkyBitz GLS database. Each message is unique by the combination of timestamp and Mobile Terminal Serial Number (S/N).

Note: The measure of GLS quality is as follows:

- 0 = Excellent (accurate to 15 meters, 9 times out of 10)
- 1 = Good (accurate to 50 meters, 9 times out of 10)
- 2 = Fair (accurate to 150 meters, 9 times out of 10)

Note: Keep a database record of each query issued and whether an XML response was received. When using the "ALL" keyword, please space your requests at least 30 minutes apart.

**Note: You can avoid inserting duplicate position data into your database by using the unique combination of the <mtsn> value (Mobile Terminal Serial Number) and the <time> value (timestamp) to eliminate messages downloaded more than once.**

The format of an XML document containing the most recent GLS position message for an asset as seen in Internet Explorer is as follows:

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```

<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
- <skybitz>
  <error>0</error>
  - <gls>
    <mtsn>MTXB6NC0140426130</mtsn>
    <asset>
      <assetid>T23456</assetid>
      <assettype>Semi-Trailer</assettype>
      <owner>ABC Trucking, Inc.</owner>
    </asset>
    <messagetype>Scheduled</messagetype>
    <extpwr>1</extpwr>
  - <serial>
    <serialtype>1</serialtype>
    <serialid>0</serialid>
    <serialname>Cargo</serialname>
    <serialdata>Empty</serialdata>
  </serial>
  <latitude>39.59066</latitude>
  <longitude>-76.01664</longitude>
  <speed> 32.2 </speed>
    <heading>SW</heading>
    <headinginddegrees> 240.2 </headinginddegrees>
  <battery>EXT</battery>
  <time>2004/05/10 03:01:46</time>
  <quality>0</quality>
  - <landmark>
    <geoname>Perryville</geoname>
    <state>MD</state>
    <country>US</country>
    <distance>0.15</distance>
    <direction>SW</direction>

  </landmark>
  <skyfence>
    <skyfencestatus>In</skyfencestatus>
    <departureskyfence>XYZ Fence</departureskyfence>
  </skyfence>
  - <idle>
    <idlestatus>IDLE</idlestatus>
    <idleduration>2.54</idleduration>
    <idlegap>1</idlegap>
  </idle>
</gls>
</skybitz>

```

### 4.3 Query List

The QueryList command enables retrieval of Mobile Terminal and Asset information from the SOC database. Currently, only Mobile Terminal profile information can be retrieved. A profile is a set of configuration parameters governing Mobile Terminal operation on the SkyBitz network.

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### 4.3.1 Query List Structure

In order to query the SkyBitz SOC for a list of information about one or many Mobile Terminals, the following structure should be used:

`http://xml.skybitz.com:nnnn/QueryList?assetid=[assetid]&listtype=[list_type]&profileid=[profile_id]&customer=[user_name]&password=[password]`

[mtsn] is the set of 25 character Serial Number(s) (case sensitive) for which a list of information is requested. Valid values are:

- A single Serial Number (example: MTXA0NC0125201811)
- ALL (provides data for all Serial Numbers assigned to your account)

OR

[assetid] - is the Asset ID string (case sensitive) of your asset for which a list of information is requested. Valid values are:

- A single Asset ID string (example: T123456)
- ALL (provides data for all Asset IDs assigned to your account)

OR

[group] - is the group name string (case sensitive) of a group of assets for which a list of information is requested. Valid values are:

- An existing group name string of up to 20 characters (example: 534nn, denoting a group containing all Asset IDs between 53400 and 53499)

[list\_type] – Currently, the list\_type parameter must be set to “profiles”. In a future release, group, asset and landmark information will be available list types.

[profile\_id] – There are 5 profile identifiers that can be supplied as this parameter value. Valid profile identifiers are:

**Contracted** profiles are the GLS service settings for your Mobile Terminals that are specified in a customer's service agreement with SkyBitz. There is a Contracted profile governing both Wake Up and Reporting. A customer's Mobile Terminals will usually operate at these Contracted settings.

A **Custom** profile is any Wake Up or Reporting setting that differs from the Contracted profile of the same type. You have the option to configure Mobile Terminals to operate according to custom profiles for a temporary period, when more frequent reporting and wake ups are required.

A **Panic Mode** profile settings configures the MT to transmit a position report every 3 minutes 12 seconds for a period of up to 6 hours. This profile is useful when a customer has an emergency situation and needs to create a “breadcrumb trail” to follow the path of an asset in order to intercept or recover it (e.g. if a trailer is suspected to have been stolen).

**Event Response** profiles are generated when an Event occurs at a Mobile Terminal and the Event activates a temporary profile in response. This type of profile creates a “breadcrumb trail” to follow the path of an asset after the Event has occurred (e.g. tether to a tractor).

---

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Supplying "ALL" as the profile\_id parameter value will generate a list of all profiles for the asset, MT serial number or group.

[user\_name] - is your SkyBitz Username (case sensitive) that has View Profile privilege and access to the specified Mobile Terminal(s)

[password] - is your SkyBitz Password (example: track-it123)

An XML response document returned with an <error> element containing the value "0" indicates that the command has been submitted successfully (there was no error).

#### **4.3.2 Query for List of All Profiles for a Single Asset**

To retrieve a list of all profiles for a single Asset ID:

<http://xml.skybitz.com:nnnn/QueryList?assetid=T234567&listtype=profiles&profileid=ALL&customer=ABC Trucks&password=track-it123>

#### **4.3.3 Query for List of Custom Profiles for All Assets**

To retrieve a list of custom profiles for all Asset IDs:

<http://xml.skybitz.com:nnnn/QueryList?assetid=ALL&listtype=profiles&profileid=custom&customer=ABC Trucks&password=track-it123>

#### **4.3.4 Query for List of Custom Profiles for a Group of Assets**

To retrieve a list of contracted profiles for all members of a group, a valid group name must be specified and the user must have permission to access the group. Here's an example retrieving all Contracted Profiles for a group named "Reefers":

<http://xml.skybitz.com:nnnn/QueryList?group=Reefers&listtype=profiles&profileid=contracted&customer=ABC Trucks&password=track-it123>

#### **4.3.5 QueryList Profile List Response XML Document**

The format of the QueryList data returned is an XML document that can be validated using the SkyBitz XML Document Type Definition (DTD). The XML tags in the document are populated with profile information from the SkyBitz GLS database.

An example of an XML document containing QueryList Profile data as seen in Internet Explorer is as follows:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
- <skybitz>
  <error>0</error>
  - <profile>
    <mtsn>MTXBANC0142239520</mtsn>
    <asset>
      <assetid>T456789</assetid>
      <assettype>Reefer</assettype>
      <owner>ABC Trucking, Inc.</owner>
    </asset>
    <profiletype>Reporting</profiletype>
    <profilenum>0045</profilenum>
    <profileid>Custom Temporary</profileid>
    <profilepwr>IntExt</profilepwr>
    <profilestatus>Active</profilestatus>
    <time>2004/06/19 05:58:51</time>
    <expiration>2004/06/25 23:10:55</expiration>
    <nextaction>2004/06/21 00:49:31</nextaction>
  </profile>
  - <profile>
    <mtsn>MTXBANC0142239520</mtsn>
    <asset>
      <assetid>T456789</assetid>
      <assettype>Reefer</assettype>
      <owner>ABC Trucking, Inc.</owner>
    </asset>
    <profiletype>Reporting</profiletype>
    <profilenum>0001</profilenum>
    <profileid>Contracted</profileid>
    <profilepwr>IntExt</profilepwr>
    <profilestatus>Suspended</profilestatus>
    <time>2004/06/18 23:10:58</time>
  </profile>
  - <profile>
    <mtsn>MTXBANC0142239520</mtsn>
    <asset>
      <assetid>T456789</assetid>
      <assettype>Reefer</assettype>
      <owner>ABC Trucking, Inc.</owner>
    </asset>
    <profiletype>Wake Up</profiletype>
    <profilenum>1022</profilenum>
    <profileid>Contracted</profileid>
    <profilepwr>IntExt</profilepwr>
    <profilestatus>Active</profilestatus>
    <time>2004/06/19 12:50:03</time>
    <nextaction>2004/06/21 00:17:31</nextaction>
  </profile>
</skybitz>
```

#### 4.1 Query Mileage

---

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The QueryMileage command enables retrieval of Mileage information of Mobile Terminal from the SOC database.. Customers can retrieve mileage of trips in a given time period for a single Asset or All of their assets using this facility. Additional filters are available as described below

**Date Filter:**

Provide a 'From' and 'To' Date to retrieve the mileage information captured for the asset criteria during the given time period. [ It is expected that the duration of this lookup is either day or a week or a month if the user implements a periodic retrieval using poll mechanism. For customers who need as-and-when information from the system, the Data Push mechanism is recommended]. Please note that the system retains 90days of Mileage Information in the online database. For lookups older than 3 months, SkyBitz Customer Care should be contacted.

**Mileage Setup Filter:**

Devices may require additional setup to transmit mileage information to the system. This filter can be used to narrow down results based on their current mileage setup status.



#### 4.1.1 Query Mileage Structure

In order to query the SkyBitz SOC for a list of mileage information about one or many Mobile Terminals, the following structure should be used:

`http://xml.skybitz.com:nnnn/QueryMileage?assetid=[assetid]&mileagesetupstatus=[mileagesetupstatus]&from=[ dd/mon/yyyy-hh:mm:ss] &to=[ dd/mon/yyyy-hh:mm:ss]&customer=[user_name]&password=[password]&version=[version]`

[mtsn] is the set of upto 25 character Serial Number(s) (case sensitive) for which a list of information is requested. Valid values are:

- A single Serial Number (example: MTXA0NC0125201811)
- ALL (provides data for all Serial Numbers assigned to your account)

OR

[assetid] - is the Asset ID string (case sensitive) of your asset for which a list of information is requested. Valid values are:

- A single Asset ID string (example: T123456)
- ALL (provides data for all Asset IDs assigned to your account)

OR

[group] - is the group name string (case sensitive) of a group of assets for which a list of information is requested. Valid values are:

- An existing group name string of up to 20 characters (example: 534nn, denoting a group containing all Asset IDs between 53400 and 53499)

[mileagesetupstatus] – This parameter allows the user to filter their lookups based on the current mileage setup status of the Asset with respect to its ability to provide mileage information. The possible values for this parameter are :”CONFIGURED”, “NOTCONFIGURED”, “ALL”

[user\_name] - is your SkyBitz Username (case sensitive) that has View Profile privilege and access to the specified Mobile Terminal(s)

[password] - is your SkyBitz Password (example: track-it123)

[from] & [to] – are date/time values denoting the time period where . These are required parameters.

dd - is the 2-digit day of the month (example: 11)

Mon - is the case sensitive 3-character month (valid values are: jan, feb, mar, apr, may, jun, jul, aug, sep, oct, nov, dec)

yyyy - is the 4-digit year (example: 2003)

hh – is the 2-digit hour of the day (valid values are between 0 and 23)

mm – is the 2-digit minutes value (valid values are between 0 and 59)

---

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ss – is the 2-digit seconds value (valid values are between 0 and 59)

Be sure when specifying values for “from” and “to” that the former is older than the latter.

NOTE: if the “from” and “to” fields are omitted, the XML interface will return the most recent position for the Serial Numbers or Asset IDs specified.

NOTE: the XML interface will interpret the “from” and “to” values as UTC (Co-ordinated Universal Time), which is EST North America + 5 hours.

[version] – is the version number of the SkyBitz XML implementation.

An XML response document returned with an `<error>` element containing the value “0” indicates that the command has been submitted successfully (there was no error).

#### 4.1.2 Query for List of All Mileage Details for a Single Asset in a given time period

To retrieve a list of all mileage records for a single Asset ID:

```
http://xml.skybitz.com:nnnn/QueryMileage?assetid=T234567&mileagesetupstatus=ALL&from=<fromDate>
&to=<toDate>&customer=ABCTrucks&password=track-it123
```

#### 4.1.3 Query for List of Mileage Details for All Assets in a given time period

To retrieve a list of mileage details for all Asset IDs:

```
http://xml.skybitz.com:nnnn/
QueryMileage?assetid=ALL&mileagesetupstatus=ALL&from=<fromDate>&to=<toDate>&customer=ABCTr
ucks&password=track-it123
```

#### 4.1.4 Query for List of Mileage details for Assets Not configured for Mileage Reporting

To retrieve a list of Assets in the account that are not configured for Mileage Reporting:

```
http://xml.skybitz.com:nnnn/QueryMileage?assetid=ALL&mileagesetupstatus= NOTCONFIGURED
&customer=ABCTrucks&password=track-it123
```

#### 4.1.5 QueryMileage List Response XML Document

The format of the QueryMileage data returned is an XML document that can be validated using the SkyBitz XML Document Type Definition (DTD). The XML tags in the document are populated with mileage information from the SkyBitz database.

```
<?xml version=\“1.0\” encoding=\“utf-8\”?>
<!DOCTYPE skybitz [
```

---

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```
<!ELEMENT skybitz (error, transid?, (mileage)*)>
<!ELEMENT error ( #PCDATA ) >
<!ELEMENT mtsn (#PCDATA)>
<!ELEMENT asset (assetid, tractorid?,assettype, owner)>
<!ELEMENT tractorid (#PCDATA)>
<!ELEMENT assetid ( #PCDATA ) >
<!ELEMENT assettype ( #PCDATA ) >
<!ELEMENT owner (#PCDATA)>
<!ELEMENT mileage ( mtsn, asset, mileagecapable, mileagesetupstatus, mileagedetails* ) >
<!ELEMENT mileagecapable ( #PCDATA ) >
<!ELEMENT mileagesetupstatus ( #PCDATA ) >
<!ELEMENT mileagedetails ( mileagedate, mileagelnMiles, mileagelnKM, timestamp ) >
<!ELEMENT mileagedate ( #PCDATA ) >
<!ELEMENT mileagelnMiles ( #PCDATA ) >
<!ELEMENT mileagelnKM ( #PCDATA ) >
<!ELEMENT timestamp ( #PCDATA ) >
<!ELEMENT transid ( #PCDATA ) >]>
```

An example of an XML document containing QueryMileage data as seen in Internet Explorer is as follows:

In the response below, there were two mileage

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
- <skybitz>
  <error>0</error>
  <transid>12345</transid>
  - <mileage>
    <mtsn>MTXBANC0142239520</mtsn>
    <asset>
      <assetid>T456789</assetid>
      <assettype>Reefer</assettype>
      <owner>ABC Trucking, Inc.</owner>
    </asset>
    <mileagecapable>Y</mileagecapable>
    <mileagesetupstatus>Configured</mileagesetupstatus>
    - <mileagedetails>
      <mileagedate>2013/08/18 17:44:45</mileagedate>
      <mileageInMiles>142.92</mileageInMiles>
      <mileageInKM>230</mileageInKM>
      <timestamp>20130819000209549109</timestamp>
    </mileagedetails>
    - <mileagedetails>
      <mileagedate>2013/08/18 22:01:51</mileagedate>
      <mileageInMiles>206.52</mileageInMiles>
      <mileageInKM>332.36</mileageInKM>
      <timestamp>20130819000209558262</timestamp>
    </mileagedetails>
  </mileage>
  - <mileage>
    <mtsn>MTXBANC0142239523</mtsn>
    <asset>
      <assetid>T456784</assetid>
      <assettype>Reefer</assettype>
      <owner>ABC Trucking, Inc.</owner>
    </asset>
    <mileagecapable>Y</mileagecapable>
    <mileagesetupstatus>Configured</mileagesetupstatus>

    < mileagedetails>
      < mileagedate >2004/06/19 04:58:51</ mileagedate >
      < mileageInMiles >12.40</ mileageInMiles >
      < mileageInKM >10.12</ mileageInKM >
      < timestamp >2004/06/19 06:10:55</ timestamp >
    < mileagedetails>
    < mileagedetails>
      < mileagedate >2004/06/19 02:58:51</ mileagedate >
      < mileageInMiles >10.40</ mileageInMiles >
      < mileageInKM >8.16</ mileageInKM >
      < timestamp >2004/06/19 06:10:55</ timestamp >
    < mileagedetails>
```

---

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</mileage>  
</skybitz>

## 4.2 Query Total Device Mileage

The QueryTotalDeviceMileage command enables retrieval of Total Device Mileage ( equivalent to a virtual odometer reading ) of Mobile Terminals from the SOC database. Customers can retrieve this virtual odometer mileage for a single Asset or All of their assets using this facility.

### 4.2.1 Query Total Device Mileage Structure

In order to query the SkyBitz SOC for total device mileage for one or many Mobile Terminals, the following structure should be used:

`http://xml.skybitz.com:nnnn/QueryTotalDeviceMileage?mtsn=[mtsn]&customer=[user_name]&password=[password]&version=[version]`

[mtsn] is the set of upto 25 character Serial Number(s) (case sensitive) for which a list of information is requested. Valid values are:

- A single Serial Number (example: MTXA0NC0125201811)
- ALL (provides data for all Serial Numbers assigned to your account)

[user\_name] - is your SkyBitz Username (case sensitive) that has XML Access privilege and access to the specified Mobile Terminal(s)

[password] - is your SkyBitz Password (example: track-it123)

[version] – is the version number of the SkyBitz XML implementation.

An XML response document returned with an `<error>` element containing the value “0” indicates that the command has been submitted successfully (there was no error).

#### 4.2.1.1 Query Total Device Mileage of a Single MTSN

To retrieve the current total device mileage for a single Mobile terminal use its Serial number as follows:

`http://xml.skybitz.com:nnnn/QueryTotalDeviceMileage?mtsn=T234567&customer=ABC Trucks&password=track-it123`

#### 4.2.1.2 Query Total Device Mileage for All Serial Numbers

To retrieve a list of total device mileage details for all devices in the account :

---

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http://xml.skybitz.com:nnnn/QueryTotalDeviceMileage?mtsn=ALL&customer=ABCTrucks&password=track-it123

#### 4.2.2 QueryTotalDeviceMileageResponse XML Document

The format of the QueryTotalDeviceMileage data returned is an XML document that can be validated using the SkyBitz XML Document Type Definition (DTD). The XML tags in the document are populated with mileage information from the SkyBitz database.

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE skybitz [
<!ELEMENT skybitz (error, totalmileage*)>
<!ELEMENT totalmileage ( mtsn, asset, totaldevicemileage, timestamp)>
<!ELEMENT mtsn (#PCDATA)>
<!ELEMENT asset (assetid, tractorid?,assettype, owner)>
<!ELEMENT tractorid (#PCDATA)>
<!ELEMENT assetid ( #PCDATA ) >
<!ELEMENT assettype ( #PCDATA ) >
<!ELEMENT owner (#PCDATA)>
<!ELEMENT totaldevicemileage ( #PCDATA ) >
<!ELEMENT timestamp ( #PCDATA ) >]>
```

An example of an XML document containing [QueryTotalDeviceMileage](#) data as seen in Internet Explorer is as follows:

In the response below, there were two devices mileage

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
- <skybitz>
  <error>0</error>
  <transid>12345</transid>
  - <totalmileage >
    <mtsn>MTXBANC0142239520</mtsn>
    <asset>
      <assetid>T456789</assetid>
      <assettype>Reefer</assettype>
      <owner>ABC Trucking, Inc.</owner>
    </asset>
    <totaldevicemileage >142.92</totaldevicemileage >
    <timestamp >20130819000209549109</timestamp >
  </totalmileage >
  - <totalmileage >
    <mtsn>MTXBANC0142239523</mtsn>
    <asset>
      <assetid>T456784</assetid>
      <assettype>Reefer</assettype>
      <owner>ABC Trucking, Inc.</owner>
    </asset>
    <totaldevicemileage >12.40</totaldevicemileage >
    <timestamp >2004/06/19 06:10:55</timestamp >
  </totalmileage >
</skybitz>
```

## 4.3 Query Container Associations

The QueryContainerAssociations command enables retrieval of container details associated with and asset id.

### 4.3.1 Query Container Associations Structure

In order to query the SkyBitz SOC for the latest container associations for one or many Mobile Terminals, the following structure should be used:

```
http://xml.skybitz.com:nnnn/
QueryContainerAssociations?assetid=[assetid]&customer=[user_name]&password=[password]&v
ersion=[version]&from=[fromdatetime]&to=[todatetime]
```

[assetid] - is the Asset ID string (case sensitive) of your asset for which a list of information is requested. Valid values are:

- A single Asset ID string (example: T123456)
- ALL (provides data for all Asset IDs assigned to your account)

---

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[user\_name] - is your SkyBitz Username (case sensitive) that has XML Access privilege and access to the specified Mobile Terminal(s)

[password] - is your SkyBitz Password (example: track-it123)

[version] – is the version number of the SkyBitz XML implementation (optional)

[fromdatetime] – optional parameter to denote the time period to lookup historical container associations for a single asset. It denotes the beginning of the time period a date/time in UTC following the date format dd/mmm/yyyy—HH24:MI:SS ( example 07/Feb/2016-23:43:43)

[todatetime] – optional parameter to denote the end of the time period to lookup historical container associations for a single asset. It must be a date/time in UTC following the date format dd/mmm/yyyy—HH24:MI:SS ( example 07/Feb/2016-23:43:43)

An XML response document returned with an `<error>` element containing the value “0” indicates that the command has been submitted successfully (there was no error).

#### 4.3.1.1 Query Container Associations of a Single AssetID

To retrieve the current container associations for a single Asset use its assetId as follows:

```
http://xml.skybitz.com:nnnn/QueryContainerAssociations?assetid=T234567&customer=ABCTrucks
&password=track-it123
```

#### 4.3.1.2 Query Container Associations for All Asset IDs

To retrieve a list of current container association for all devices in the account :

```
http://xml.skybitz.com:nnnn/QueryContainerAssociations?assetid=ALL&customer=ABCTrucks&pass
word=track-it123
```

#### 4.3.2 QueryContainerAssociations Response XML Document

The format of the QueryContainerAssociations data returned is an XML document that can be validated using the SkyBitz XML Document Type Definition (DTD). The XML tags in the document are populated with container details from the SkyBitz database.

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE skybitz [
<!ELEMENT skybitz (error, containerassociation*)>
<!ELEMENT containerassociation ( mtsn, asset, container)>
<!ELEMENT mtsn (#PCDATA)>
<!ELEMENT asset (assetid, tractorid?,assettype, owner)>
```

---

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```
<!ELEMENT tractorid (#PCDATA)>
<!ELEMENT assetid ( #PCDATA ) >
<!ELEMENT assettype ( #PCDATA ) >
<!ELEMENT owner (#PCDATA)>
<!ELEMENT container (containerid, scac,containertype?, truckingcompany?, associateddtm,
endofassociationdtm?)>
<!ELEMENT containerid ( #PCDATA ) >
<!ELEMENT scac ( #PCDATA ) >
<!ELEMENT containertype ( #PCDATA ) >
<!ELEMENT truckingcompany ( #PCDATA ) >
<!ELEMENT associateddtm ( #PCDATA ) >
<!ELEMENT endofassociationdtm ( #PCDATA ) >]
```

The details of the tags returned in the response are document in the section '[SkyBitz XML Tags](#)'

An example of an XML document containing [QueryContainerAssociations](#) data as seen in Internet Explorer is as follows:

In the response below, there were two container associations found for the request

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
- <skybitz>
  <error>0</error>

  - <containerassociation>
    <mtsn>MTXBANC0142239520</mtsn>
    <asset>
      <assetid>T456789</assetid>
      <assettype>Reefer</assettype>
      <owner>ABC Trucking, Inc.</owner>
    </asset>
    <container>
      <containerid>C456789< containerid >
      <scac>RTRR</scac >
      <containertype>42</ containertype >
      <truckingcompany>Joe White </truckingcompany >
      <associateddtm>07/Feb/2016-23:12:34</associateddtm >
      < endofassociationdtm>09/Feb/2016-13:12:34 < /endofassociationdtm>

    </ container >

  </ containerassociation >
  <containerassociation >
    <mtsn> MTXBANC0142239523</mtsn>
    <asset>
      <assetid> T456784</assetid>
      <assettype>Reefer</assettype>
      <owner>ABC Trucking, Inc.</owner>
    </asset>
    <container>
      <containerid>C456789< containerid >
      <scac>RTRR</scac >
      <containertype>40</containertype>
```

---

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```
<truckingcompany>XYZ Company</truckingcompany >
<associateddtm>07/Feb/2016-23:12:34</associateddtm >

</ container >

</ containerassociation >
</skybitz>
```

## 5 Data Push

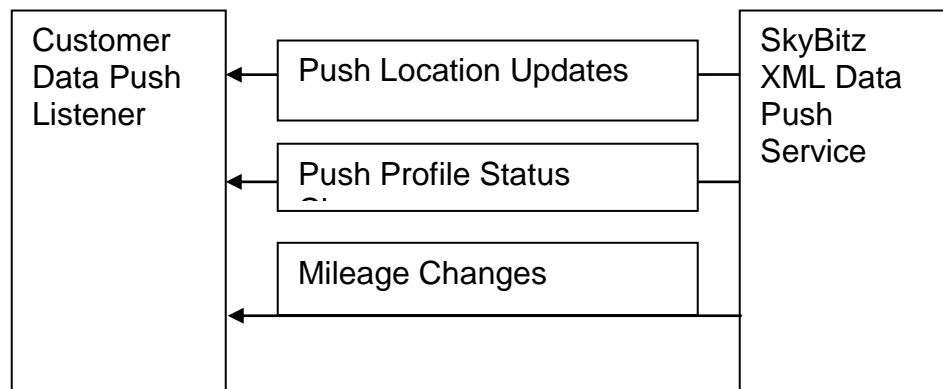
### 5.1 Protocol

The SkyBitz SOC provides the ability to forward incoming messages from Mobile Terminals to client systems without the need for client processes to poll for new data periodically. The SkyBitz Document Type Definition (DTD) defines the XML document format of delivered content. The Data Push is supported from version 2.58 and above.

The client should provide a service endpoint (Data Push Listener) that can consume XML over HTTP ( or HTTPS ) posted content. Servers supporting HTTPS must identify themselves with a certificate issued by a standard Trusted CA.

#### 5.1.1 Authentication

Data updates will be submitted using Basic access authentication. Customer shall provide the authentication credentials (username and password) at the time of setup that will be included in the authorization headers on every data push attempt.



Every message delivered to the client must be acknowledged.

A minimum of 2 Listeners must be maintained by the customer. SkyBitz shall support delivery to both the destinations simultaneously. Successful transmission to any 1 of the destinations will be considered sufficient to remove the record from any redelivery attempts.

Data Push will be FIFO by Mobile terminal. Failure to send a message of a Mobile Terminal will block other messages from the same MT to be sent to the client. i.e., the Data Push gives precedence to ordered delivery of messages per MT over latency of delivery.

---

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If a message of one MT is blocked, it will not affect messages of other Mobile Terminals.

It is assumed that the customer will provide a test environment that will be used during any development, test and/or on-going troubleshooting of these capabilities.

Existing XML Data Service that supports periodic poll of location updates for all customer assets will continue to support polling of locations even if assets have been enabled for the Data Push Service. In case a customer requests an asset data to be pushed as well as continues to poll for its data using the Data Pull service, SkyBitz expects that the customer will handle any redundant data transmitted into their systems from these multiple requests.

## **5.2 Setup Procedures**

Customers who want to receive Mobile Terminal location updates via the Data Push mechanism should contact SkyBitz to subscribe to this service. Following is an outline of the steps to setup the Data Push Service:

1. Customer contacts SkyBitz Sales Representative to subscribe to the Data Push service
2. SkyBitz Customer Care (CC) will contact the Customer to discuss details of the subscription
3. SkyBitz CC will provide the latest XML API documentation to the Customer
4. Customer will develop software to consume messages from the Data Push service
5. Customer will contact SkyBitz CC with details of the Data Push Listener(s) and also the set of API commands that will be utilized for the integration.
6. Customer will provide a Point of Contact name, phone number and email address (preferably a distribution list). Monitoring alarms and notifications will be sent to this address to respond to any system failures, if required.

Customer should provide the mileage push setup requirements –

1. Batch Data Update  
Mileage Information captured for a period will be pushed to the client. User should provide the Filters applicable to compile the periodic data updates.  
OR
2. Live Data Update  
The system will push mileage details to the client as and when the mileage is available in the system.  
**OR Both**
7. SkyBitz CC will setup your account for the appropriate privileges and register the server URLs that will receive data updates. [Note that this step captures the service destination and does not automatically start data push for any asset. The XML API should be used to enable/disable location updates for individual assets.]
8. Customer will verify the integration in their dev/test environment.
9. Customer will deploy Production Listeners
10. Customer will contact SkyBitz CC and provide URLs for the Production Listeners
11. SkyBitz CC will setup your production account to begin Data push to the Production listeners. Test/Dev listener updates will be turned off at this point.

---

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12. If any issues are detected on this Data Push interface please contact SkyBitz Customer Care at 1-866-875-9248 or send an email to "[customercare@skybitz.com](mailto:customercare@skybitz.com)"

## 5.3 Data Push Features

SkyBitz Data Push service supports the following details to be automatically pushed to the client systems.

### 5.3.1 Location Updates:

Once enabled, all incoming messages from the Mobile Terminal will be pushed to the client server. These would typically include all Scheduled reports, Events, Page Responses, transmissions due to Panic, Lockdown and other custom profile changes. Messages from one MT or multiple MTs will not be batched even if they came in close time proximity. i.e., 1 XML Packet per MT per report will be delivered on the Data Push interface. The customer listener must acknowledge the receipt of each message before subsequent messages for the MT will be delivered.

Once an ACK is received from any of the registered listeners, the subsequent message(s) will be delivered to all the listeners.

### Sample XML

```
<skybitz>
  <error>0</error>
  <gls>
    <mtsn>GTP45EIT111900084</mtsn>
    <asset><assetid>TAP_SB_2</assetid>
    <assettype>None</assettype>
    <owner>ABC Inc.</owner>
  </asset>
  <messageType>Event</messageType>
  <binary>
    <inputid>1</inputid>
    <inputname>Door</inputname>
    <inputval>0</inputval>
    <inputstate>Closed</inputstate>
    <timeofreading>2012/10/17 18:11:52</timeofreading>
    <event>E</event>
    <inputenabled>1</inputenabled>
  </binary>
  <binary>
    <inputid>2</inputid>
    <inputname>Light</inputname>
    <inputval>0</inputval>
    <inputstate>Dark</inputstate>
    <inputenabled>1</inputenabled>
  </binary>
  <extpwr>0</extpwr>
  <latitude>39.59066</latitude>
  <longitude>-76.01664</longitude>
```

---

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```

    <speed> 32.2 </speed>
      <heading>SW</heading>
      <headinginddegrees> 240.2 </headinginddegrees>

    <battery>EXT</battery>
    <time>2004/05/10 03:01:46</time>
    <quality>0</quality>
  - <landmark>
      <geoname>Perryville</geoname>
      <state>MD</state>
      <country>US</country>
      <distance>0.15</distance>
      <direction>SW</direction>

    </landmark>
  <transid>10212</transid>
</gls>
</skybitz>

```

Listener URL sample:

Listeners should support HTTP GET and POST of xml formatted data. Example -  
[http://dataexchange.abctrucking.com:8080/receive?username=<xyz>&password=<\\*\\*\\*>](http://dataexchange.abctrucking.com:8080/receive?username=<xyz>&password=<***>)

### 5.3.2 Profile Status Change Updates :

In addition to Location updates, any changes to the Mobile Terminals profiles (Reporting and/or wakeup profiles) can also be requested to be pushed to the client listener.

A sample XML of the Profile Status change is listed below

```

<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
- <skybitz>
  <error>0</error>
  - <profile>
    <mtsn>MTXBANC0142239520</mtsn>
    <asset>
      <assetid>T456789</assetid>
      <assettype>Reefer</assettype>
      <owner>ABC Trucking, Inc.</owner>
    </asset>
    <profiletype>Reporting</profiletype>
    <profilenum>0045</profilenum>
    <profileid>Custom Temporary</profileid>
    <profilepwr>IntExt</profilepwr>
    <profilestatus>Active</profilestatus>
    <time>2004/06/19 05:58:51</time>
    <expiration>2004/06/25 23:10:55</expiration <nextaction>2004/06/21
      00:49:31</nextaction>
    <transid>10223</transid>
  </profile>
</skybitz>

```

---

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### 5.3.3 KeepAlive

SkyBitz will send periodic heartbeat messages (aka keepalive) to registered client listeners. These keepalive messages must be acknowledged similar to data messages. This facility can be used to monitor the status of the XML push interface. Note that keepalive messages will be sent at regular intervals, irrespective of whether data messages were sent over the interface during that interval.

The default heartbeat rate is once every 2 minutes to each registered url.

Sample Heartbeat from SkyBitz Data Push Service to client listener.

```
<skybitz><keepalive>true</keepalive></skybitz>
```

### 5.3.4 Mileage Push Updates

Any changes to the Mobile Terminals can be requested to be pushed to the client listener. The system computes the mileage as and when position reports that qualify for mileage data collection are received. Customers may also optionally setup a periodic batch XML push of all their mileage data. Customers may choose to receive Mileage Push updates for specific product types such as GXT3000 only, GXT2000 and GXT3000 etc. Please contact SkyBitz Customer Care for setting up your account to receive mileage push updates.

Refer to section 4.1.5 for the structure of the XML to be sent to the client listener for mileage data push.

All Data push messages must be acknowledged by the recipient.

### 5.3.5 Acknowledgements

All Location Updates, Profile Change updates, Mileage Data Packets and Heartbeats sent to the client system must be acknowledged using the XML construct detailed here. The <transid> must match the <transid> value of the received update.

```
<skybitz>  
<transid>10212</transid>  
<errordesc>Success</errordesc>  
</skybitz>
```

Failure to acknowledge a data push update from an MT will cause all other data push updates from that MT to be blocked from delivery.

Failure to acknowledge heartbeats will cause alarms to be sent.

**Successful acknowledgement from any one of the several client listeners will be considered a successful delivery to the client.**

---

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## **6 Forward Commands API**

### ***6.1 Paging a Mobile Terminal***

Paging a Mobile Terminal involves sending a command in the forward direction via satellite from the SkyBitz SOC to a specific Mobile Terminal, in order to command it to perform an action (e.g. send back a new GLS data sample for position). Customers can initiate a Paging Request through the SkyBitz web site or XML interface.

A Paging Response to the command is not immediate. Most MT units are set up with a Wake Up Profile, which governs the duration that an MT will sleep between receives. MT units spend most of the time asleep to conserve their battery and this sleep time is configurable over the air. During each Wake Up, an MT will check if it is being paged by the SkyBitz gateway. If the MT receives a Paging Request, it will perform the requested action.

The average response time to a Page Request is one-half of the wake up interval defined by the Mobile Terminal's Wake Up Profile.

There are 2 types of Wake Up Profiles, "large" and "fast". A "large" Wake Up Profile's wake up interval can be any of the following values: 16 minutes, 32 minutes, 64 minutes, 96 minutes, 2 hours, 4 hours and 6 hours. The shorter the wakeup interval, the shorter the life of the internal battery of the MT will be if an external power source is not available. A "Fast Wake Up" profile has a non-configurable wake up interval that is less than 2 minutes. Fast Wake Up enables the Mobile Terminal to respond in near-real-time to Paging Requests. However, external power to the MT is required to support this profile due to the very short sleep time between receives.

#### **6.1.1 RequestPage Command Structure**

In order to page a unit directly from a remote system, the following URL and structure are required:

```
http://xml.skybitz.com:nnnn/RequestPage?pagecmd=[pagecmd]&mtsn=[mtsn]&customer=[user_name]&password=[password]
```

OR

```
http://xml.skybitz.com:nnnn/RequestPage?pagecmd=[pagecmd]&assetid=[assetid]&customer=[user_name]&password=[password]
```

The values shown in brackets are the parameters required to page an individual MT. The specific options are:

[pagecmd] - enter "request" or "cancel" (minus the quotes or brackets) to request or cancel a page to a Mobile Terminal (any other value will return an error). If an MT is already being paged when a Paging Request is submitted, an error will be returned. Also, an error will be returned if a cancel page command is submitted and there is no active page request for the MT that can be cancelled.

[mtsn] - is the 25 character Serial Number (case sensitive) of the unit to be paged, OR

---

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[assetid] - is the Asset ID string of your asset whose MT is to be paged

[user\_name] - is your SkyBitz Username (case sensitive) that has Paging privilege and access rights to the specified Mobile Terminal.

[password] - is your SkyBitz Password (case sensitive) associated with your Username.

An XML response document returned with an `<error>` element containing the value "0" indicates that the command has been submitted successfully (there was no error).

### 6.1.2 Sending a Page Request to a Mobile Terminal

The following example shows how to send a page request to Mobile Terminal "MTXA0NC0125201811" with a Username of "ABC Trucks" and password of "track-it123":

```
http://xml.skybitz.com:nnnn/RequestPage?pagecmd=request&mtsn=MTXA0NC0125201811&customer=ABC Trucks&password=track-it123
```

The following example shows how to page Asset ID "T123456" with a Username of "ABC Trucks" and password of "track-it123":

```
http://xml.skybitz.com:nnnn/RequestPage?pagecmd=request&assetid=T123456&customer=ABC Trucks&password=track-it123
```

### 6.1.3 Canceling a Page Request to a Mobile Terminal

The following example shows how to cancel a page to Asset ID "T345678" with a Username of "ABC Trucks" and password of "track-it123":

```
http://xml.skybitz.com:nnnn/RequestPage?pagecmd=cancel&assetid=T345678&customer=ABC Trucks&password=track-it123
```

## 6.2 Panic Operations

A special Panic Mode Profile can be requested and sent from the SkyBitz SOC to a specific Mobile Terminal. Once received, this profile will cause the MT to transmit GLS position reports every 3 minutes 12 seconds for a period of up to 6 hours. While a Panic Mode Profile is in effect, it supersedes all other profiles that the MT has. This profile is useful when a customer has an emergency situation and needs to create a "breadcrumb trail" to follow the path of an asset in order to intercept or recover it (e.g. if a trailer is suspected to have been stolen).

In order to put a Mobile Terminal in "Panic Mode," the customer must first have the privilege to do so on the SkyBitz network. The **Panic Operations** feature on the SkyBitz InSight web site enables users to put MT units in Panic Mode (a valid user login is required first). The SkyBitz XML interface also supports Panic Operations, as long as the user login credentials have the privilege to use the feature.

**Note:** Contact SkyBitz customer care via e-mail ([customercare@skybitz.com](mailto:customercare@skybitz.com)) if you require access to Panic Operations from your user account.

---

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### 6.2.1 PanicMode Command Structure

The following URL commands can be used to “toggle” the Mobile Terminal in or out of “Panic Mode”:

```
http://xml.skybitz.com:nnnn/PanicMode?status=[status]&mtsn=[mtsn]&customer=[user_name]&password=[password]
```

OR

```
http://xml.skybitz.com:nnnn/PanicMode?status=[status]&assetid=[assetid]&customer=[user_name]&password=[password]
```

The customer’s application can denote the desired Mobile Terminal either by Asset ID or Serial Number (S/N). The values shown in brackets are the required parameters:

[status] – valid values are "on" (to turn on “Panic Mode”) and “off” (to turn it off)

[mtsn] - is the 25 character Serial Number (case sensitive) of the Mobile Terminal to be put in Panic Mode

[assetid] - is the Asset ID string of your asset whose MT is to be put in Panic Mode

[user\_name] - is your SkyBitz Username (case sensitive) that has Panic Operations privilege and access rights to the specified Mobile Terminal.

[password] - is your SkyBitz Password (case sensitive) associated with your Username.

An XML response document returned with an `<error>` element containing the value “0” indicates that the command has been submitted successfully (there was no error).

### 6.2.2 PanicMode Examples

Here are examples of “Panic Mode” commands with a Username of “ABCTrucks” and Password of “track-it123”.

The following example illustrates how to turn on Panic Mode for Mobile Terminal Serial Number “MTXA0NC0125201811”

```
http://xml.skybitz.com:nnnn/PanicMode?status=on&mtsn=MTXA0NC0125201811&customer=ABCTrucks&password=track-it123
```

The following example illustrates how to turn off Panic Mode for Asset ID “T123456”

```
http://xml.skybitz.com:nnnn/PanicMode?status=off&assetid=T123456&customer=ABCTrucks&password=track-it123
```

An XML document returned with an `<error>` element containing the value “0” indicates that the command has been submitted successfully (there was no error).

### 6.3 Changing a Mobile Terminal Profile

---

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Mobile Terminals operate on the SkyBitz network governed by profiles. A profile is a set of configuration parameters controlling the frequency of transmissions and wake ups of a Mobile Terminal. Contracted Profiles are the specified settings for Mobile Terminals according to a customer's service agreement with SkyBitz. There is a Contracted profile for both Wake Up and Reporting and most Mobile Terminals in a customer's population will usually operate according to these Contracted settings. A Custom profile is any Wake Up or Reporting setting that differs from the Contracted profile of the same type. Customers have the option to command Mobile Terminals to operate according to custom profiles for a temporary duration, when more frequent reporting and wake ups are required.

Wake Up Profile – This setting is a configurable time period that the Mobile Terminal will sleep between receives.

Reporting Profile – This setting is the number of times per day that the Mobile Terminal will transmit its GLS position. The time between each transmission is always 24 hours divided by the number of reports per day (e.g. if the Reporting frequency is 4 per day, the interval between transmissions is  $24/4 = 6$  hours).

If a customer purchases a **Custom Report Bank** from SkyBitz, the Reporting Profile of Mobile Terminals can be changed to send more frequent GLS positions for a specified duration (1 to 7 days). Each time a Custom Reporting profile is requested, a deduction is made from the Custom Report Bank that was purchased.

The Change Profile feature has been developed to enable temporary changes to the Wake Up and Reporting profiles on one Mobile Terminal at a time. The following URL and structure are required:

`http://xml.skybitz.com:nnnn/ChangeProfile?assetid=[assetid]&profilenum=[profile_num]&duration=[duration]&customer=[user_name]&password=[password]&motionstate=[any|idle|moving]&replaceprofilechoice=[none|match]`

OR

`http://xml.skybitz.com:nnnn/ChangeProfile?mtsn=[mtsn]&profilenum=[profile_num]&duration=[duration]&customer=[user_name]&password=[password]`

The values shown in brackets are the parameters required to page an individual MT. The specific options are:

[assetid] – is the Asset ID string of your asset whose MT is be sent a Custom Profile, OR

[mtsn] – is the 25 character Serial Number (case sensitive) of the MT that will be sent a Custom Profile

[profilenum] – Profile Numbers follow the formula “tnnn”, where t is the type of profile (0 = reporting, 1 = wake up, 2 = fast page) and nnn is the frequency per day of the profile. The available Profile Numbers selections are shown in the table below:

Profile Number	Frequency
0001	1 report per day
0002	2 reports per day
0004	4 reports per day
0006	6 reports per day
0012	12 reports per day
0022	22 reports per day
1004	6 hour wake up interval
1006	4 hour wake up interval

---

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1012	2 hour wake up interval
1015	96 minute wake up interval
1022	64 minute wake up interval
1045	32 minute wake up interval
1090	16 minute wake up interval
2000	fast page

[duration] – is the number of days that the temporary profile will last (can be 0,1, 2, 3, 4, 5, 6, 7 days)

[user\_name] – is your SkyBitz Username (case sensitive) that has Change Profile privilege and access rights to the specified Mobile Terminal.

[password] – is your SkyBitz Password (case sensitive) associated with your Username.

[motionstate] – is an optional parameter that is applicable to certain products ( e.g., Raptor, GTP).The user can indicate whether the custom profile should be effective while the Asset is 'idle', 'moving' or 'any' [i.e. at all times ].

[replaceprofilechoice] - If set to "none"- the system will add the custom profile in addition to existing profiles as long as there is availability on the device. If set to "match" – the system we replace a profile that best matches the custom profile being setup

**Note:** A Custom Profile cannot be requested for a Mobile Terminal that already has one of the same type pending or active.

An XML document returned with an <error> element containing the value "0" indicates that the command has been submitted successfully (there was no error).

### 6.3.1 Terminating a Custom Profile

All Custom Profiles will end on their expiration date, which is returned in the <expiration> element. Alternatively, any existing Custom Profile can be terminated early by setting its duration to 0. Terminating a Custom Reporting Profile early will result in the SkyBitz SOC crediting the customer's Custom Report Bank with the portion of unused reports equal to the time that the profile was not active.

**Note:** Any Custom Profile can be ended before its expiration date by submitting the same ChangeProfile command with the same Profile Number but with the duration set to 0.

### 6.3.2 ChangeProfile Examples

Here are examples of Change Profile commands with a Username of "ABC Trucks" and Password of "track-it123".

The following example illustrates how to submit a request for a 12 reports per day Custom Reporting Profile on Mobile Terminal Serial Number "MTXA0NC0125201811" that will run for 5 days:

http://xml.skybitz.com:nnnn/ChangeProfile?mtsn=MTXA0NC0125201811&profilenum=0012&duration=5&customer=ABC Trucks&password=track-it123

The following example illustrates how to submit a request for a 32 minute Custom Wake Up Profile on Asset ID "T123456" that will run for 3 days:

---

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<http://xml.skybitz.com:nnnn/ChangeProfile?assetid=T123456&profilenum=1045&duration=3&customer=ABC Trucks&password=track-it123>

The following example illustrates how to submit a request to end the above 32 minute Custom Wake Up Profile on Asset ID "T123456" before its expiration date:

<http://xml.skybitz.com:nnnn/ChangeProfile?assetid=T123456&profilenum=1045&duration=0&customer=ABC Trucks&password=track-it123>

#### 6.4 Query Setup Definitions

The <setup> element is an optional element present in a SkyBitz XML document when the client requests to retrieve existing setup definitions. The customer can setup types of Assets using the SkyBitz online and associate them to the Asset ID . The <asset> element simply provides the name of the <assettype> whereas the <assettypedef> element gives elaborate details of the asset type definitions . This XML pull mechanism can be used to retrieve all the asset type definitions for the customer

<http://xml.skybitz.com:nnnn/QuerySetups?setuptype=assettypes&customer=ABC Trucks&password=track-it123>

#### 6.5 Configure Assets Operations

##### 6.5.1 Request Install MT on an Asset

A Mobile Terminal shipped to a customer has no Asset ID in the system and is denoted by 'n/a'. Once the MT is installed on an Asset, the user can register the action of Install MT providing the date of installation and the Asset ID on which the MT has been installed. This will associate the given Asset ID to all information of the MT e.g., position reports etc, as of the install date.

Command Structure of MT Install:

[http://xml.skybitz.com:nnnn/ConfigureAssets?actiontype=\[actiontype\]&assetid=\[assetid\]&mtsn=\[mtsn\]&actiondate=\[actionDate\]&customer=\[user\\_name\]&password=\[password\]&actionusr=\[actionusr\]&speedviolationthreshold=\[speedviolationthreshold\]&speedviolationduration=\[speedviolationduration\]](http://xml.skybitz.com:nnnn/ConfigureAssets?actiontype=[actiontype]&assetid=[assetid]&mtsn=[mtsn]&actiondate=[actionDate]&customer=[user_name]&password=[password]&actionusr=[actionusr]&speedviolationthreshold=[speedviolationthreshold]&speedviolationduration=[speedviolationduration])

**Optional Parameters to the command:**

**"assetype=[assettype]&assetnote=[assetnote]&actionusr=[actionusr]&speedviolationthreshold=[speedviolationthreshold]&speedviolationduration=[speedviolationduration]"**

The values shown in brackets are the parameters required to install an individual MT. The specific options are:

[actiontype] – actiontype denotes the Asset Management action being requested. The following table lists all action types for 'Configure Assets'

Action Type	Action
1	Install MT on Asset
2	De-Install MT

---

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3	Replace MT
4	Move MT
5	Set Asset Type for Asset

[assetid] – is the Asset ID string of your asset on which the MT has been installed. Assetid cannot have any MT on or after the actiondate.

[mtsn] – is the 25 character Serial Number (case sensitive) of the MT that has been installed. Mtsn must be an uninstalled MT on and after actiondate.

[actiondate] – is the date of installation of MT on the asset. The format of the date must be ‘dd/mon/yyyy-hh:mm:ss’ as explained in the section for QueryPositions for a date range.

[user\_name] – is your SkyBitz Username (case sensitive) that has Asset Management privilege and access rights to the specified Mobile Terminal.

[password] – is your SkyBitz Password (case sensitive) associated with your Username.

**Optional Parameters to the command:**

**“asetype=[asetype]&assetnote=[assetnote]&actionUsr=[actionusr]”**

[asetype] – is the asset type string to be associated with asset id

[assetnote] – Comments for the asset (optional). This is a free-form comment that is an attribute of the Asset. Customers may choose to standardize the format of this field. Please contact SkyBitz customer care to setup your account to accept a delimited text of multiple key/value pairs in this field for the asset.

[actionusr] – Optional parameter denoting the user with whom to associate this action and asset note. The user name must be an active user for the same account as the xml request user.

[speedviolationthreshold] – Optional parameter denoting speed in KPH. This parameter is applicable to certain products such as Raptor and is used to configure the Device to send alerts if it detects the Asset is moving above this speed threshold setting for a duration of [speedviolationduration] minutes.

[speedviolationduration] – Optional parameter denoting a duration in minutes for Speed threshold violation alerts. Certain products such as Raptor are capable of monitoring the motion speed and if the asset is moving over the limit specified by [speedviolationthreshold] for a duration over [speedviolationduration] minutes, an alert will be sent to the system.

## 6.5.2 Request MT De-Install

If a Mobile Terminal has been de-installed from an Asset for some reason, the action must be registered into the system using the appropriate date in order that the information ( position reports) etc are consistent. Provide the Asset ID and the MT S/N involved in the de-install and the date on which the MT S/N has been removed from the asset.

Command Structure of MT De-Install:

http://xml.skybitz.com:nnnn/ConfigureAssets?actiontype=[actionType]&assetid=[assetid]&mtsn=[mtsn]&actiondate=[actionDate]&customer=[user\_name]&password=[password]&actionusr=[actionusr]&rmalnd=[rmalnd]

---

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The values shown in brackets are the parameters required to de-install an individual MT. The specific options are:

[actiontype] – actiontype denotes the Asset Management action being requested. The following table lists all action types for 'Configure Assets'

Action Type	Action
1	Install MT on Asset
2	<b>De-Install MT</b>
3	Replace MT
4	Move MT
5	Set Asset Type for Asset

[assetid] – is the Asset ID string of your asset from which the MT has been de-installed

[mtsn] – is the 25 character Serial Number (case sensitive) of the MT that has been de-installed.mtsn must belong to the given assetid on and after actiondate.

[actiondate] – is the date of de-installation of MT on the asset. The format of the date must be 'dd/mon/yyyy-hh:mm:ss' as explained in the section for QueryPositions for a date range.

[user\_name] – is your SkyBitz Username (case sensitive) that has Asset Management privilege and access rights to the specified Mobile Terminal.

[password] – is your SkyBitz Password (case sensitive) associated with your Username.

[assetnote] – Comments for the asset (optional)

[actionusr] – Optional parameter denoting the user with whom to associate this action and asset note. The user name must be an active user for the same account as the xml request user.

[rmaInd] – Optional parameter. Can be set to 'y' or 'n' and setting this to 'y' will mark the MT being de-installed to be flagged as a candidate for RMA. Users of Insight can track these units separately from the rest of the uninstalled MT population.

### 6.5.3 Request Replace MT

If an Asset has had its MT replaced with a newer MT, the action must be registered into the system using the appropriate date in order that the information ( position reports) etc are consistent. Provide the Asset ID and the old MT S/N , the new MT S/N and the replacement date, the date on which the old MT S/N has been removed from the asset and the new MT S/N was installed. Use this action when there is no gap between the date the old MT was removed from the asset and the new MT was installed on the asset.

Command Structure of MT Replace:

http://xml.skybitz.com:nnnn/ConfigureAssets?actiontype=[actionType]&assetid=[assetid]&mtsn=[mtsn]&newmtsn =[newmtsn]&actiondate=[actionDate]&customer=[user\_name]&password=[password]&actionusr=[actionusr]&rmaInd=[rmaInd]&speedviolationthreshold=[speedviolationthreshold]&speedviolationduration=[speedviolationduration]

The values shown in brackets are the parameters required to de-install an individual MT. The specific options are:

---

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[actiontype] – actiontype denotes the Asset Management action being requested. The following table lists all action types for 'Configure Assets'

Action Type	Action
1	Install MT on Asset
2	De-Install MT
<b>3</b>	<b>Replace MT</b>
4	Move MT
5	Set Asset Type for Asset

[assetid] – is the Asset ID string of your asset on which the new MT is being installed

[mtsn] – is the 25 character Serial Number (case sensitive) of the MT is being removed/replaced. Mtsn must belong to the assetid on and after actiondate.

[newmtsn]- is the 25 character Serial Number (case sensitive) of the MT that is installed on the Asset. Newmtsn must be an uninstalled MT on and after the actiondate.

[actiondate] – is the date of replacement of old MT with the new MT on the asset. The format of the date must be 'dd/mon/yyyy-hh:mm:ss' as explained in the section for QueryPositions for a date range.

[user\_name] – is your SkyBitz Username (case sensitive) that has Asset Management privilege and access rights to the specified Mobile Terminal.

[password] – is your SkyBitz Password (case sensitive) associated with your Username.

[assetnote] – Comments for the asset (optional). This is a free-form comment that is an attribute of the Asset. Customers may choose to standardize the format of this field. Please contact SkyBitz customer care to setup your account to accept a delimited text of multiple key/value pairs in this field for the asset.

[actionusr] – Optional parameter denoting the user with whom to associate this action and asset note. The user name must be an active user for the same account as the xml request user.

[rmaInd] – Optional parameter. Can be set to 'y' or 'n' and setting this to 'y' will mark the MT being de-installed to be flagged as a candidate for RMA. Users of Insight can track these units separately from the rest of the uninstalled MT population.

[speedviolationthreshold] – Optional parameter denoting speed in KPH. This parameter is applicable to certain products such as Raptor and is used to configure the Device to send alerts if it detects the Asset is moving above this speed threshold setting for a duration of [speedviolationduration] minutes.

[speedviolationduration] – Optional parameter denoting a duration in minutes for Speed threshold violation alerts. Certain products such as Raptor are capable of monitoring the motion speed and if the asset is moving over the limit specified by [speedviolationthreshold] for a duration over [speedviolationduration] minutes, an alert will be sent to the system.

#### 6.5.4 Request Move/Transfer MT

When an MT is re-used and moved from one asset to another asset, register the action using this command. Provide the old asset id, the new asset id and the MT S/N of the MT that was moved from the old asset to the new. The date the move occurred will enable the position information to be correctly associated with the appropriate Asset

Command Structure of Move/Transfer MT:

---

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http://xml.skybitz.com:nnnn/ConfigureAssets?actiontype=[actionType]&assetid=[assetid]&mtsn=[mtsn]&newassetid=[newassetid]&actiondate=[actionDate]&customer=[user\_name]&password=[password]&actionusr=[actionusr]&speedviolationthreshold=[speedviolationthreshold]&speedviolationduration=[speedviolationduration]

**Optional Parameters to the command:**

**“assettype=[assettype]&assetnote=[assetnote]&actionusr=[actionusr] ]&speedviolationthreshold=[speedviolationthreshold]&speedviolationduration=[speedviolationduration]”**

The values shown in brackets are the parameters required to de-install an individual MT. The specific options are:

[actiontype] – actiontype denotes the Asset Management action being requested. The following table lists all action types for ‘Configure Assets’

Action Type	Action
1	Install MT on Asset
2	De-Install MT
3	Replace MT
<b>4</b>	<b>Move MT</b>
5	Set Asset Type for Asset

[assetid] – is the Asset ID string of your asset from which the MT is being moved/de-installed

[mtsn] – is the 25 character Serial Number (case sensitive) of the MT that is being moved. Mtsn must belong only to the given assetid for all dates on and after actiondate.

[newassetid]- is the Asset ID string of your asset on which the mtsn is being installed/moved. Newassetid cannot have another installed MT on it on or after the action date.newassetid must not have any other mtsn on or after the actiondate.

[actionDate] – is the date of moving the MT from the old asset id to the new. The format of the date must be ‘dd/mon/yyyy-hh:mm:ss’ as explained in the section for QueryPositions for a date range.

[user\_name] – is your SkyBitz Username (case sensitive) that has Asset Management privilege and access rights to the specified Mobile Terminal.

[password] – is your SkyBitz Password (case sensitive) associated with your Username.

[assettype] – is the asset type string to be associated with asset id

[assetnote] – Comments for the asset (optional)

[actionusr] – Optional parameter denoting the user with whom to associate this action and asset note. The user name must be an active user for the same account as the xml request user.

[speedviolationthreshold] – Optional parameter denoting speed in KPH. This parameter is applicable to certain products such as Raptor and is used to configure the Device to send alerts if it detects the Asset is moving above this speed threshold setting for a duration of [speedviolationduration] minutes.

[speedviolationduration] – Optional parameter denoting a duration in minutes for Speed threshold violation alerts. Certain products such as Raptor are capable of monitoring the motion speed and if the asset is moving over the limit specified by [speedviolationthreshold] for a duration over [speedviolationduration] minutes, an alert will be sent to the system.

---

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### 6.5.5 Request Change Asset Type of an Asset

Asset Types that have been set up using the UI can be associated with any of your assets via XML.

Command Structure of Move/Transfer MT:

`http://xml.skybitz.com:nnnn/ConfigureAssets?actiontype=[actionType]&assetid=[assetid]&assettype=[assettype]&customer=[user_name]&password=[password]&actionusr=[actionusr]`

The values shown in brackets are the parameters required to de-install an individual MT. The specific options are:

[actiontype] – actiontype denotes the Asset Management action being requested. The following table lists all action types for 'ConfigureAssets'

Action Type	Action
1	Install MT on Asset
2	De-Install MT
3	Replace MT
4	Move MT
5	<b>Set Asset Type for Asset</b>

[assetid] – is the Asset ID string of your asset

[assettype] – is the Asset type string to assign to the asset

[user\_name] – is your SkyBitz Username (case sensitive) that has Asset Management privilege and access rights to the specified Mobile Terminal.

[password] – is your SkyBitz Password (case sensitive) associated with your Username.

[assetnote] – Comments for the asset (optional)

[actionusr] – Optional parameter denoting the user with whom to associate this action and asset note. The user name must be an active user for the same account as the xml request user.

### 6.5.6 Query Install MT Status

This facility is useful to lookup the status of a device installation. SkyBitz devices that support an activation (magnet swipe ) step during the install process should be validated using this facility to confirm that the install has been completed

Requests must be submitted to the following URL and include the id/password information in the query string.

---

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[http://xml.skybitz.com:nnnn/QueryInstallMTStatus?customer=\[user\\_name\]&password=\[password\]&mtsn=\[serialnumber\]](http://xml.skybitz.com:nnnn/QueryInstallMTStatus?customer=[user_name]&password=[password]&mtsn=[serialnumber])

[mtsn] – is the 25 character Serial Number (case sensitive) of the MT that is being installed on the Asset.

[user\_name] – is your SkyBitz Username (case sensitive) that has Asset Management privilege and access rights to the specified Mobile Terminal.

[password] – is your SkyBitz Password (case sensitive) associated with your Username.

Response to the request to Query Install MT Status would be formatted as shown below

```
<skybitz>
<error>0</error>
</skybitz>
```

The possible values of <error> tags for this request type are

- 0 – Install Success
- 401 – Device is Communicating but No Asset ID associated with device
- 402 – Device is NOT Communicating, Asset ID associated with MT Serial Number
- 403 – Device is NOT Communicating, No Asset ID associated with MT Serial Number

It is possible to receive other error codes such as invalid user, invalid serial number etc as per the generic Error codes listed in section 'Error Codes'.

### 6.5.7 Associate Container to Asset

This API call can be used to associate details of the container for an asset. The following details can be associated with an asset :

- 1.container ID
2. SCAC
2. type of the container
3. trucking company
4. date and time the details apply to the asset.

**Requests must be submitted to the following URL and include the id/password information in the query string.**

[http://xml.skybitz.com:nnnn/AssociateContainer?customer=\[user\\_name\]&password=\[password\]](http://xml.skybitz.com:nnnn/AssociateContainer?customer=[user_name]&password=[password])

**The details of asset/container associate must be in the POST content in the following XML format described below. Multiple associate requests may be submitted in a single post request.**

The format of the associate container requests must be validated using the SkyBitz XML Document Type Definition (DTD) defined below.

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE SkyBitz [
<!ELEMENT SkyBitz (AssociateContainerReq *)>
```

---

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```
<!ELEMENT AssociateContainerReq (assetid, container)>
  <!ELEMENT assetid ( #PCDATA ) >
  <!ELEMENT container (containerid, scac,containertype?,truckingcompany?,
  associateddtm)>
  <!ELEMENT containerid ( #PCDATA ) >
  <!ELEMENT scac ( #PCDATA ) >
  <!ELEMENT containertype( #PCDATA ) >
  <!ELEMENT truckingcompany ( #PCDATA ) >
  <!ELEMENT associateddtm ( #PCDATA ) >]>
```

Sample XML :

```
<SkyBitz>
  <AssociateContainerReq>
  <assetid>testAssetID</assetid>
  <container>
  <containerid> HGFD2110 </containerid>
  <scac>LRGT </scac>
  <containertype> 40HC </containertype>
  <truckingcompany>ABC Company</truckingcompany>
  <associateddtm>07/Feb/2016-12:40:16</associateddtm>
  </container>
  </AssociateContainerReq>
  <AssociateContainerReq>
  <assetid>testAssetID2</assetid>
  <container>
  <containerid> HGFD2111 </containerid>
  <scac>LRGT </scac>
  <containertype> 20GP </containertype>
  <truckingcompany>Joe Black</truckingcompany>
  <associateddtm>07/Feb/2016-12:35:16</associateddtm>
  </container>
  </AssociateContainerReq>
</SkyBitz>
```

The format and conditions applicable to these input data are documented in the definition of fields under the section 3 '[SkyBitz XML Tags](#)'.

The response from the server will include 1 entry per associate requests.It is possible for some associate requests to fail while the others get processed successfully.

The format of the response to associate container requests must validate using the SkyBitz XML Document Type Definition (DTD) defined below.

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE SkyBitz [
<!ELEMENT SkyBitz (error,AssociateContainerRes*)>
<!ELEMENT AssociateContainerRes (assetid, containerid, associateddtm,
error)>
<!ELEMENT error ( #PCDATA ) >
<!ELEMENT assetid ( #PCDATA ) >
<!ELEMENT containerid ( #PCDATA ) >
<!ELEMENT associateddtm ( #PCDATA ) >
]>
```

---

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Following is a sample Response XML for request to associate containers:

```
<SkyBitz>
<error>0</error> <!--indicates status of entire request batch -- >
<AssociateContainerRes> <!-- identifies responses for a single associaterequest -- >
<assetid>testAssetID</assetid><!--assetid,containerid and date time in response-- >
<containerid> HGFD2110 </containerid>
<associateddtm>07/Feb/2016-12:40:16</associateddtm>
<error>0</error> <!--indicates processing status of a particular associate request-- >
</AssociateContainerRes>
<AssociateContainerRes>
<assetid>testAssetID2</assetid>
<containerid> HGFD2111 </containerid>
<associateddtm>07/Feb/2016-12:35:16</associateddtm>
<error>0</error>
</AssociateContainerRes>
</SkyBitz>
```

Error Codes

0 – Success

Non-Zero – Refer to Error Codes section for various errors and their details.

### 6.5.8 End Current Container to Asset Association

This API call can be used to end the container association for an asset. The following details are needed in this API call:

1. asset ID
2. container ID
3. date and time to end the association.

**Requests must be submitted to the following URL and include the id/password information in the query string.**

[http://xml.skybitz.com:nnnn/AssociateContainer?customer=\[user\\_name\]&password=\[password\]](http://xml.skybitz.com:nnnn/AssociateContainer?customer=[user_name]&password=[password])

**The details of asset/container associate must be in the POST content in the following XML format described below. Multiple associate requests may be submitted in a single post request.**

The format of the associate container requests must be validated using the SkyBitz XML Document Type Definition (DTD) defined below.

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE SkyBitz [
<!ELEMENT SkyBitz (EndContainerAssociationReq*)>
<!ELEMENT EndContainerAssociationReq (assetid, containerid,
endassociationdtm)>
  <!ELEMENT assetid ( #PCDATA ) >
  <!ELEMENT containerid ( #PCDATA ) >
  <!ELEMENT endassociationdtm ( #PCDATA ) >]>
```

Sample XML :

---

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```
<SkyBitz>
< EndContainerAssociationReq>
<assetid>testAssetID</assetid>
<containerid> HGFD2110 </containerid>
<endassociationdtm>07/Feb/2016-13:40:16</endassociationdtm>
</EndContainerAssociationReq>
<EndContainerAssociationReq>
<assetid>testAssetID2</assetid>
<containerid> HGFD2111 </containerid>
<endassociationdtm>07/Feb/2016-15:35:16</endassociationdtm>
</EndContainerAssociationReq>

</SkyBitz>
```

[assetid] - is the Asset ID string (case sensitive) of your asset for which the container details need to be ended. Valid values are:

- A single Asset ID string (example: T123456)

[containerenddtm] – provide a date in the past to end the container/asset association. This must be after the latest associated date/time of container details for the given assetid. The date/time format should be dd/MMM/yyyy-HH24:MI:SS ( example 07/Feb/2016-12:34:34 ) .All Date time inputs are considered to be in UTC timezone.

[user\_name] - is your SkyBitz Username (case sensitive) that has XML Access privilege and access to the specified Mobile Terminal(s)

[password] - is your SkyBitz Password (example: track-it123)

[version] – is the version number of the SkyBitz XML implementation

An XML response document returned with an <error> element containing the value “0” indicates that the command has been submitted successfully (there was no error).

The response from the server will include 1 entry per requests. It is possible for some end association requests to fail while the others get processed successfully.

The format of the response to end container association requests must validate using the SkyBitz XML Document Type Definition (DTD) defined below.

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE SkyBitz [
<!ELEMENT SkyBitz (error, EndContainerAssociationRes*)>
<!ELEMENT EndContainerAssociationRes (assetid, containerid,
endassociationdtm, error)>
<!ELEMENT error ( #PCDATA ) >
<!ELEMENT assetid ( #PCDATA ) >
<!ELEMENT containerid ( #PCDATA ) >
```

---

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```
<!ELEMENT endassociationdtm ( #PCDATA ) >
]>
```

Following is a sample Response XML for request to associate containers:

```
<SkyBitz>
<error>0</error> <!--indicates status of entire request batch -- >
<EndContainerAssociationRes> <!-- identifies responses for a single
associaterequest -- >
<assetid>testAssetID</assetid><!--assetid,containerid and date time in response-- >
<containerid> HGFD2110 </containerid>
<endassociationdtm>07/Feb/2016-13:40:16</endassociationdtm>
<error>0</error> <!--indicates processing status of a particular associate request-- >
</EndContainerAssociationRes>
<EndContainerAssociationRes>
<assetid>testAssetID2</assetid>
<containerid> HGFD2111 </containerid>
<endassociationdtm>07/Feb/2016-15:35:16</endassociationdtm>
<error>0</error>
</EndContainerAssociationRes>
</SkyBitz>
```

Error Codes

0 – Success

Non-Zero – Refer to Error Codes section for various errors and their details.

## 6.6 Configure Groups

The Group Management facility available in Customer Insight is now available over the XML interface. Some operations for groups management involve lengthy input requests ( e.g. setting a list of asset ids to a group ) and thus the service has been enhanced to accept input request as an XML formatted Data Stream over an HTTP POST request.

**Requests must be submitted to the following URL and include the id/password information in the query string. The group management specific requests must be in the POST content in the appropriate XML format.**

[http://xml.skybitz.com:nnnn/ConfigureGroups?customer=\[user\\_name\]&password=\[password\]](http://xml.skybitz.com:nnnn/ConfigureGroups?customer=[user_name]&password=[password])

**NOTE: Refer to DTD at [SkyBitz Data ML](#) for the valid request/response XML format.**

The sections below describe the individual Group Management operations supported over the XML Interface with examples of request and response xml content.

### 6.6.1 View A Group or All Groups

The <GrpGetReq> tag is used for requesting a group definition. The response to this request is sent in a <GrpGetRes> element in the response xml.

---

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Group Definition for a single group called 'myGroup' can be obtained using the following request.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data
Management 1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpGetReq>
<GrpName> myGroup </GrpName>
</GrpGetReq>
</SkyBitz>
```

If the group exists, the response to the request will include the group name and any associated group level emails for notification.

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpGetRes>
<GrpDetail>
<GrpName>MYGROUP </GrpName>
<GrpSize>7</GrpSize>
<GrpEmails><EmailAddress>me@mycom.com</EmailAddress>
</GrpEmails>
</GrpDetail>
</GrpGetRes>
</SkyBitz>
```

If the group doesn't exist , the response will contain an error code to indicate that a group with the given name wasn't found.

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<error>107</error>
</SkyBitz>
```

The <GrpGetReq> can be used to retrieve all groups definitions in a single request. If the request does not contain a group name, the response will include all the groups setup for the account.

## 6.6.2 Add a Group

The <GrpAddReq> element is used to request to add a new group definition. The response to this request is sent in a <GrpAddRes> element in the response xml.

Example: To add a group named 'Test Add'

---

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```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data
Management 1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpAddReq>
<GrpName> test add</GrpName>
</GrpAddReq>
</SkyBitz>
```

On successful processing the response XML will look like

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data
Management 1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpAddRes>
<GrpName>TEST_ADD</GrpName>
<error>0</error>
</GrpAddRes>
</SkyBitz>
```

If the group already exists

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data
Management 1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpAddRes>
<error>106</error>
</GrpAddRes>
</SkyBitz>
```

### 6.6.3 Delete a Group

The <GrpRemoveReq> element is used to request a group to be deleted.  
Example : To delete a group named 'Test Add'

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data
Management 1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpRemoveReq>
<GrpName> test_add</GrpName>
</GrpRemoveReq>
</SkyBitz>
```

If the group is successfully deleted the response xml will look like

```
<?xml version="1.0" encoding="utf-8"?>
```

---

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```
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpRemoveRes><GrpName>TEST_ADD</GrpName><error>0</error>
</GrpRemoveRes>
</SkyBitz>
```

## 6.6.4 Modify a Group

The group name and/or Email Addresses associated with a group can be changed using the <GrpModifyReq>

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpModifyReq>
<GrpName> test_add</GrpName>
<NewGrpName> test add changed </NewGrpName>
<GrpEmails>
<EmailAddress> test@mycom.com </EmailAddress>
<EmailAddress> test1@mycom.com </EmailAddress>
</GrpEmails>
</GrpModifyReq>
</SkyBitz>
```

On successful processing the response will include entire group definition.

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpModifyRes>
<GrpDetail>
<GrpName>test add</GrpName>
<GrpSize>0</GrpSize>
<GrpEmails>
<EmailAddress>test1@mycom.com</EmailAddress>
<EmailAddress>test@mycom.com</EmailAddress>
</GrpEmails>
</GrpDetail>
<error>0</error>
</GrpModifyRes>
</SkyBitz>
```

On error , the error code will be sent back in the <GrpModifyRes> element

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
```

---

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```
<GrpModifyRes>
<error>107</error>
</GrpModifyRes>
</SkyBitz>
```

### 6.6.5 Get Assets of a Group

Submit a <GrpAssetGetReq> to view the assets that are part of a group.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpAssetGetReq>
<GrpName> test add </GrpName>
</GrpAssetGetReq>
</SkyBitz>
```

The <GrpAssetGetRes> will list all Asset IDs that belong to the group currently.

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpAssetGetRes>
<GrpName>test add</GrpName>
<AssetID>1075</AssetID>
<AssetID>1036</AssetID>
<AssetID>1042</AssetID>
<error>0</error>
</GrpAssetGetRes>
</SkyBitz>
```

If the group has no Assets associated with it, the response will return a response with error set to 0.

```
<?xml version="1.0" encoding="utf-8"?><?xml version="1.0"
encoding="UTF-8"?><!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML
Data Management 1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpAssetGetRes>
<error>0</error>
</GrpAssetGetRes>
</SkyBitz>
```

### 6.6.6 Add Asset To Group

Submit a <GrpAssetAddReq> to add asset ids to an existing group. You may submit multiple Asset IDs as a single request to be added to a group. However it is an all or nothing request, ie., even if a single Asset ID fails to validate, the entire request is rejected.

---

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```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpAssetAddReq>
<GrpName> test add </GrpName>
<AssetID>1036</AssetID>
<AssetID>1042</AssetID>
<AssetID>1075</AssetID>
</GrpAssetAddReq>
</SkyBitz>
```

The response to the GrpAssetAddReq will be sent in a GrpAssetAddRes, as follows:

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpAssetAddRes>
<GrpName>test add</GrpName>
<error>0</error>
</GrpAssetAddRes>
</SkyBitz>
```

**NOTE:** There is a limit to the size of a group. Currently a group cannot be defined with more than 1000 Assets.

## 6.6.7 Remove Asset From Group

Submit a <GrpAssetRemoveReq> to delete an asset from Group membership.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpAssetRemoveReq>
<GrpName> test add </GrpName>
<AssetID>1036</AssetID>
</GrpAssetRemoveReq>
</SkyBitz>
```

The response to <GrpAssetRemoveReq> will be sent in a <GrpAssetRemoveRes> as follows:

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
```

---

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```
<GrpAssetRemoveRes>  
<GrpName>test add</GrpName>  
<error>0</error>  
</GrpAssetRemoveRes>  
</SkyBitz>
```

### 6.6.8 Get Users For a Group

Submit a <GrpUserGetReq> to obtain a list of Users who are permitted to view a group. SkyBitz supports user management in the SkyBitz Insight. There are currently three types of customer users – Administrator, Standard users and Regular users. All Administrators and Standard users are permitted to operate on all groups implicitly.

Regular users are limited to viewing Asset population contained in the groups they are granted access to.

Hence this interface will present a list of Regular users who are allowed to operate on the group.

```
<?xml version="1.0" encoding="UTF-8"?>  
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management  
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">  
<SkyBitz>  
<GrpUserGetReq>  
<GrpName> test add </GrpName>  
</GrpUserGetReq>  
</SkyBitz>
```

If there are no users , the response will contain the appropriate error code.

### 6.6.9 Add User To Group

Submit <GrpUserAddReq> to add users to a group. The user must be a 'Regular' user as defined by the user setup via SkyBitz Insight.

However it is an all or nothing request, ie., even if a single User Name fails to validate, the entire request is rejected.

```
<?xml version="1.0" encoding="UTF-8"?>  
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management  
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">  
<SkyBitz>  
<GrpUserAddReq>  
<GrpName> test add </GrpName>  
<UserName> test2@skybitz.com </UserName>  
</GrpUserAddReq>  
</SkyBitz>
```

---

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The response will indicate whether the user was added to the group or not in the <GrpUserAddRes>

```
<?xml version="1.0" encoding=" utf-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpUserAddRes>
<GrpName>test add</GrpName>
<error>0</error>
</GrpUserAddRes>
</SkyBitz>
```

### 6.6.10 Remove User From Group

Submit a <GrpUserRemoveReq> to deny users permission to operate on a group

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpUserRemoveReq>
<GrpName> test add </GrpName>
<UserName> test2@skybitz.com </UserName>
</GrpUserRemoveReq>
</SkyBitz>
```

The response will be sent in the <GrpUserRemoveRes>

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE SkyBitz PUBLIC "-//SkyBitz//DTD SkyBitz XML Data Management
1.0//EN" "http://www.skybitz.com/DTD/sbml_1.0.dtd">
<SkyBitz>
<GrpUserRemoveRes>
<GrpName>test add</GrpName>
<error>0</error>
</GrpUserRemoveRes>
</SkyBitz>
```

### 6.7 DTTS Setup (Enable/ Disable )

Customers must be enabled for DTTS integration into the IRRIS Subsystem in order to utilize this feature. Please contact SkyBitz Customer Care for more details.

For the duration when the Asset is 'enabled' for DTTS , ie., being used to haul AA&E for DTTS, all location data is included into a data feed to the IRRIS sub-system.

The asset will be enabled into the DTTS data feed once it is processed by the system.

---

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### 6.7.1 Enable

Command Structure to Enable DTTS Transfer:

`http://xml.skybitz.com:nnnn/DttsSetup?assetid=[assetid&customer=[user_name]&password=[password]& dttsenable=y`

### 6.7.2 Disable

Command Structure to Disable DTTS Transfer:

`http://xml.skybitz.com:nnnn/DttsSetup?assetid=[assetid&customer=[user_name]&password=[password]& dttsenable=n`

## 6.8 Data Push Request ( Enable/Disable )

Enable all location updates from a Mobile Terminal to be pushed to a pre-registered client listener using this API request. Customers must be enabled for the Data Push Service privilege to use this API. [See section 5.2 for setup requirements prior to invoking this API].

Command Structure to Enable Data Push Transfer using an assetid:

`http://xml.skybitz.com:nnnn/RequestMTActions?applabel=[label]&assetid=[assetid]&customer=[user_name]&password=[password]&actionusr=[actionusr]&pushlocationupdates=start`

or using an mtsn,

`http://xml.skybitz.com:nnnn/RequestMTActions?applabel=[label]&mtsn=[mtsn]&customer=[user_name]&password=[password] &actionusr=[actionusr]&pushlocationupdates=start`

Command Structure to Disable Data Push Transfer:

`http://xml.skybitz.com:nnnn/RequestMTActions?assetid=[assetid]&customer=[user_name]&password=[password] &actionusr=[actionusr]&pushlocationupdates=stop`

or

`http://xml.skybitz.com:nnnn/RequestMTActions?mtsn=[mtsn]&customer=[user_name]&password=[password] &actionusr=[actionusr]&pushlocationupdates=stop`

All location updates received from the MT from the time a request to enable pushlocationupdates was sent up to the time a request to disable pushlocationupdates is received will be delivered to the registered client listener(s).

The values shown in brackets are the parameters required to request Data Push for an MT.

The details of command parameters are listed below -

---

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[applabel] – is a 20 character, customer defined string to identify the application reason for enabling/disabling location update push service. It is a required parameter and must be unique in the customer account (case in-sensitive). It is only required on the 'enable' Data Push request. The 'disable' data push request will implicitly end the Data Push for the current [applabel]. {NOTE: At this point, the applabel is meant for an internal audit tracking facility to be used for troubleshooting purposes }

[mtsn] - is the 25 character Serial Number (case sensitive) of the Mobile Terminal to be put in Data Push mode. NOTE: Only one MT at a time can be enabled for Data Push request at this time. This is to ensure there is audit tracking at a very granular level of the enable/disable of Data Push.

[assetid] - is the Asset ID string of your asset whose MT is to be put in Data Push mode. NOTE: Only one MT at a time can be enabled for Data Push request at this time.

[user\_name] - is your SkyBitz Username (case sensitive) that has Data Push Feature privilege and access rights to the specified Mobile Terminal.

[password] - is your SkyBitz Password (case sensitive) associated with your Username.

[actionusr] – is a 20 character, customer defined user name. It does not have to match the user name in SkyBitz system. This parameter is captured for audit purposes to track real user who submitted the request.

[pushlocationupdates] – is the flag that controls the start or stop of location data push to the customer listener. Valid values are "start/stop".

An XML response document returned with an <error> element containing the value "0" indicates that the command has been submitted successfully (there was no error).

## **6.9 MT Composite Actions Request**

The 'RequestMTActions' API is a facility to submit multiple Forward API requests for an MT in a single API call to the XML Data Service. It has been described in its simplest form in section 5.8 for enabling/disabling Location Data Push for one or more MTs in a customer account.

This API supports additional parameters to provide a more flexible tool to consolidate multiple Forward commands to an MT in addition to requesting the Data Push into their systems.

The following forward API commands are supported in the MT Composite Actions Request.

1. Enable/Disable Location Data Push
  2. Page
  3. Change Reporting Profile
  4. Change Wakeup Profile
- Enable/Disable Profile change updates

The RequestMTActions API can be requested with some or all of the above commands. If multiple commands are included, the system will submit commands to the MT in the order defined below.

- (1) Page
- (2) Change Reporting Profile
- (3) Change Wakeup Profile.

---

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The Enable/Disable Data Push and Enable/Disable Profile Change updates are not sent to the Mobile Terminal over the air.

Command Structure for MT Composite Actions Request :

```
http://xml.skybitz.com:nnnn/RequestMTActions?applabel=[label]&assetid=[assetid]&customer=[user_name]&password=[password]&actionusr=[actionusr]&pushlocationupdates=[start/stop]&reportingprofilenum=[reporting_profile_num]&reportingprofileduration=[reportingprofileduration]&wakeupprofilenum=[wakeup_profile_num]&wakeupprofileduration=[wakeupprofileduration]&pagecmd=[pagecmd]&pushprofilechanges=[start/stop]
```

or

```
http://xml.skybitz.com:nnnn/RequestMTActions?applabel=[label]&mtsn=[mtsn]&customer=[user_name]&password=[password]&actionusr=[actionusr]&pushlocationupdates=[start]&reportingprofilenum=[reporting_profile_num]&reportingprofileduration=[reportingprofileduration]&wakeupprofilenum=[wakeup_profile_num]&wakeupprofileduration=[wakeupprofileduration]&pagecmd=[pagecmd]
```

The values shown in brackets are the parameters required to request composite actions for an MT. The specific options for the parameters are:

[applabel] – is a 20 character, customer defined string to identify the application reason for issuing this composite command. It is a required parameter and must be unique in the customer account (case insensitive). It is only required on the 'enable' Data Push request. The 'disable' data push request will implicitly end the Data Push for the current applabel. {NOTE: At this point, the applabel is an internal audit tracking facility to be used for troubleshooting purposes }

[mtsn] - is the 25 character Serial Number (case sensitive) of the Mobile Terminal to be put in Data Push mode. NOTE: Only one MT at a time can be enabled for Data Push request at this time. This is to ensure there is audit tracking at a very granular level of the enable/disable of Data Push. Must be a valid Serial number of a mobile terminal in the customer account. Should not include keywords such as 'All' or any group name. This command is valid for a single mobile terminal only.

[assetid]- is the Asset ID string of your asset whose MT is to be put in Data Push mode. NOTE: Only one MT at a time can be enabled for Data Push request at this time. Request the command either using an Asset ID or an MTSN. Must be a valid asset id of a mobile terminal in the customer account. Should not include keywords such as 'All' or any group name. This command is valid for a single mobile terminal only.

[customer] - is your SkyBitz Username (case sensitive) that has Data Push Feature privilege and access rights to the specified Mobile Terminal.

[password] - is your SkyBitz Password (case sensitive) associated with your Username.

[actionusr] – is a 20 character, customer defined user name. It does not have to match the user name in SkyBitz system. This parameter is captured for audit purposes to track submitter of the request.

[pushlocationupdates] – is the flag that controls the start or stop of the location data push to the customer listener. Valid values for the parameter are "start"/"stop". Must be present when the pushprofilechanges parameter is present.

[reportingprofilenum] – identifies the frequency of scheduled reports for the profile. Each profile number is unique. Valid profile numbers are as outlined in the Field 74:<profilenum>.

---

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[reportingprofileduration] – is an Integer and denotes the number of days that the reporting profile will remain effective. The maximum allowed value in this input is 120. The reporting profile will be changed to the frequency specified by the reportingprofilenum parameter value for the duration specified in this parameter. At the end of this duration, the reporting profile of the MT will be reverted to its profile settings prior to the temporary profile taking effect. Must be present when the reportingprofilenum is present in the request.

[wakeupprofilenum] - defines the frequency of wake ups for the wakeup profile. Each profile number is unique. Valid profile numbers are as outlined in the Field 74:<profilenum>.

[wakeupprofileduration] – Number of days the wakeup profile will remain effective. The maximum allowed value in this parameter is 120. The wakeup profile will be changed to the frequency specified by the wakeupprofilenum parameter value for the duration specified in this parameter. At the end of this duration, the wakeup profile of the MT will be reverted to its profile settings prior to the temporary profile taking effect. Must be present when the wakeupprofilenum is present in the request.

[pagecmd] – Possible values for this parameter are ‘request’ or ‘cancel’. Standard validations and error codes applicable to ‘**RequestPage**’ will apply when this parameter is supplied in the request for MT Actions.

[pushprofilechanges] – is the flag that controls whether the profile status changes to the MT should be pushed to the customer system. Valid values for the parameter are "start"/"stop". Must be provided when pushlocationupdates parameter is included in the request.

An XML response document returned with an <error> element containing the value “0” indicates that the command has been submitted successfully (there was no error).

Each request for MT Composite Actions gets split into multiple requests and submitted for asynchronous processing into the Backend Engine. The response XML only denotes the successful submission into the backend engine. In order to track status of profile changes, it is client must enable the ‘pushprofilechanges’ option. If this option is enabled, the backend engine will monitor for any Profile status updates received from the MT and send them to be delivered to the client.

The client process will be responsible to track the complete success or failure of the request and take necessary action.

## 6.10 Cancel a Prior MT Composite Actions Request

RequestMTActions is a composite command constructed by the client. In order to cancel all the changes issued in the original request, the client must compose the parameters that will ‘undo’ the effect of the original request.

The command structure to undo the effects of ‘RequestMTActions’ is exactly the same as the request to issue the forward commands. The ‘undo’ / ‘cancel’ equivalents for the various parameters are listed in the table below –

Action	Parameter	Enable Parameter	‘Undo’ /Disable
--------	-----------	------------------	-----------------

---

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		Values	Parameter Values
Data Push	<u>pushlocationupdates</u>	"start"	"stop"
Page	<u>pagecmd</u>	"request"	"cancel" [ only effective if the page request is still active]
Change reporting profile	<u>Reportingprofilenum</u> <u>reportingprofileduration</u>	<u>Reportingprofileduration</u> is between 1 and 120	<u>Reportingprofileduration=0</u> for the same <u>Reportingprofilenum</u>
Change wakeup profile	<u>Wakeupprofilenum &amp;</u> <u>wakeupprofileduration</u>	<u>Wakeupprofileduration</u> is between 1 and 120	<u>Wakeupprofileduration =0</u> for the same <u>Wakeupprofilenum</u>
Profile Change Updates	<u>pushprofilechanges</u>	"start"	"stop"

## 7 Error Codes

The `<error>` element is always present in a SkyBitz XML document. The value contained within the `<error>` tags is "0" when a submitted command is correct and successfully processed. Any commands having errors will return an XML document that has a "non-zero" error value within the `<error>` tags.

### 7.1.1 General Error Codes

The following error codes are not specific to any XML interface command:

If a command is correct and has been successfully processed by the SkyBitz SOC, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>0</error>
</skybitz>
```

If invalid username / password parameters are specified in the command, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>1</error>
</skybitz>
```

---

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If an invalid Mobile Terminal Serial Number (S/N) or Asset ID parameter is specified in the command, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>2</error>
</skybitz>
```

If the supplied “&customer” and “&password” parameters are valid but the user does not have privilege to use the SkyBitz XML interface or a specific operation, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>9</error>
</skybitz>
```

If the user submits a command specifying a Mobile Terminal that is not in service (e.g. has been removed from the network), an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>11</error>
</skybitz>
```

If the user does not have privilege to issue a premium service request (e.g. RequestPage, PanicMode), an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>12</error>
</skybitz>
```

**Note:** Contact SkyBitz customer care via e-mail ([customercare@skybitz.com](mailto:customercare@skybitz.com)) if you encounter the above error and your account is supposed to be granted access to the refused command. Provide your customer name and username so that SkyBitz administrator can grant access for your account.

If an invalid group name parameter is specified in the command or if the user does not have access rights to view members of a valid group name, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>15</error>
</skybitz>
```

If a Mobile Terminal is specified in the command that is not registered on the SkyBitz network, an XML document will be returned containing the following error code:

---

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```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>92</error>
</skybitz>
```

If a client using the XML interface submits consecutive service requests without waiting for the SkyBitz SOC to deliver the response to the first request, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>96</error>
</skybitz>
```

**Note:** In order to ensure delivery of proper responses to all XML interface commands, it is very important to allow the SkyBitz system enough time to respond to a command before issuing a subsequent command.

If the SkyBitz XML interface is too busy serving requests from other customers, or if a new command is issued before the response to the previous one has been delivered, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>97</error>
</skybitz>
```

If the SkyBitz XML interface has been halted for scheduled maintenance, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>98</error>
</skybitz>
```

If the SkyBitz XML interface is not operational, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>99</error>
</skybitz>
```

### 7.1.2 QueryPositions Error Codes

The following error codes are specific to the QueryPositions XML interface command:

---

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If an invalid Asset ID range is specified in the QueryPositions commands (e.g. if the starting asset is greater than the ending asset in the range when sorted alphanumericly), an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>3</error>
</skybitz>
```

If the timestamp in the “&from” and / or “&to” time range parameters of a QueryPositions command is invalid (i.e. not formatted according to dd/Mon/yyyy-hh24:mi:ss), an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>4</error>
</skybitz>
```

If an invalid timestamp range is specified in the Query Positions command (e.g. the start timestamp in the range comes after the end timestamp in chronological order), an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>5</error>
</skybitz>
```

If a timestamp range is specified in the “&from” and “&to” parameters that is greater than 24 hours when retrieving positions for a multiple assets, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>16</error>
</skybitz>
```

**Note:** the maximum interval between the “from” and “to” time parameters is 24 hours when a range (of Asset IDs or Serial Numbers), a group or the “ALL” parameter is specified for retrieval of the position history of multiple units.

A timestamp range can be greater than 24 hours only when retrieving position history for 1 Mobile Terminal.

### 7.1.3 QueryList Error Codes

If the submitted QueryList command has an invalid or missing “listtype” parameter, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
```

---

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```
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>50</error>
</skybitz>
```

Note: Currently, the only valid “listtype” parameter value is “profiles”.

If the user does not have privilege to submit a QueryList request for profile information (when listtype=”profiles”), an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>51</error>
</skybitz>
```

If the submitted QueryList command has an invalid or missing “profileid” parameter, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>53</error>
</skybitz>
```

#### 7.1.4 RequestPage Error Codes

If the target Mobile Terminal Serial Number (S/N) has no page request in progress when a RequestPage cancel command is submitted with “pagecmd=cancel”, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>7</error>
</skybitz>
```

If a Mobile Terminal on an asset already has an active page in progress when another RequestPage command is issued, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>8</error>
</skybitz>
```

If an invalid "pagecmd" parameter is specified in the RequestPage command, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>10</error>
</skybitz>
```

Note: Valid "pagecmd" parameter values are "request" and "cancel". A page is scheduled by the SkyBitz gateway for the Mobile Terminal based on its next wake up time. There can be a delay of up to a full wake up interval to receive a reply. Average response time is half of the wake up interval. The MT is asleep between wake ups, unless it has to send in a Scheduled Report or process an Event. A page "cancel" command will terminate an active page request.

If the maximum number of active Page Requests has been reached on the SkyBitz network, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>94</error>
</skybitz>
```

Note: The occurrence of the above error response should be rare. If this code is returned, the customer application should wait at least 1 wake up interval of time before submitting more pages, or should cancel any active page requests to other MT units that are no longer necessary to allow others to be submitted.

### 7.1.5 PanicMode Error Codes

If a Mobile Terminal on an asset is already in "Panic Mode" when another command is submitted for the same MT with status="on", or if it is not in "Panic Mode" when another command is submitted for the same MT with status="off", an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>13</error>
</skybitz>
```

If an invalid "status" parameter is specified in the Panic Mode command, an XML document will be returned containing the following error code:

---

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```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>14</error>
</skybitz>
```

Note: Valid “status” parameter values are “on” and “off”.

If the maximum number of active and pending Panic Mode requests has been reached on the SkyBitz network, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>95</error>
</skybitz>
```

Note: The occurrence of the above error response should be rare. If this code is returned, the customer application should wait 1 wake up interval of time before trying again or cancel active PanicMode requests to other MT units that may no longer be necessary to allow others to be submitted.

#### 7.1.6 ChangeProfile Error Codes

If the user does not have privilege to submit a ChangeProfile request, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>52</error>
</skybitz>
```

If the submitted ChangeProfile command has an invalid or missing “profilenum” parameter, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>54</error>
</skybitz>
```



If the submitted ChangeProfile command has an invalid or missing “duration” parameter, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>55</error>
</skybitz>
```

Note: Valid “pagecmd” parameter values are 1 to 7 (days).

If the submitted ChangeProfile command cannot be processed by the SkyBitz SOC, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>56</error>
</skybitz>
```

If the maximum number of pending ChangeProfile requests for Custom Paging Profiles has been reached for the customer, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>57</error>
</skybitz>
```

Note: The occurrence of the above error response should be rare. If this code is returned, the customer application should wait 1 wake up interval of time before trying again or cancel active Custom Profiles on other MT units that may no longer be necessary to allow others to be submitted.

If the maximum number of pending ChangeProfile requests for Custom Reporting Profiles has been reached for the customer or if the Custom Report Bank has been drawn down to 0 reports, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>58</error>
</skybitz>
```

Note: Check the Custom Report Bank to make sure enough reports are available to cover the cost of the requested Custom Reporting Profile. Contact SkyBitz customer care via e-mail ([customercare@skybitz.com](mailto:customercare@skybitz.com)) if you need to add more reports to the bank.

If the ChangeProfile command specifies “&duration=0” and the profile number specified does not exist as a Custom Profile on the specified Mobile Terminal, an XML document will be returned containing the following error code:

---

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```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>59</error>
</skybitz>
```

If the ChangeProfile command specifies “&duration” of 1 day or more and a profile number that already exists as a Custom Profile on the specified Mobile Terminal, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>60</error>
</skybitz>
```

If the maximum number of pending ChangeProfile requests for Custom Reporting Profiles has been reached for the SkyBitz network, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>93</error>
</skybitz>
```

Note: The occurrence of the above error response should be rare. If this code is returned, the customer application should wait 1 wake up interval of time before trying again or cancel active ChangeProfile requests to other MT units that may no longer be necessary to allow others to be submitted.

### 7.1.7 Configure Assets Error Codes

The following error codes can be generated for the various actions performed as part of ConfigureAssets XML requests.

If action type parameter is missing from the request or doesn't belong to the list of valid action types, an XML document will be returned containing the following error code:

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
  < skybitz >
    < error >70</ error >
  </skybitz >
```

All the actions in ConfigureAssets that required an action date, could produce the following response if the date provided violates MT/Asset relationship validation.

E.g., the Asset ID already has an active MT on or after the actiondate provided for MT Install.

OR

The MT belongs to another Asset ID on or after the action date provided on an MT Install action

OR

MT being replaced was not on the given Asset on an MT de-install or replace action.

---

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OR MT for replace is installed on another asset for the action date.

OR MT is being moved to another Asset.

The rule is an MT can be installed only 1 Asset in any instant and An Asset can only have 1 MT installed on it in any instant.

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>71</error>
</skybitz>
```

If the asset type parameter provided on the command is invalid, the following response will be generated.

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>72</error>
</skybitz>
```

The (asset id,mtsn) combination must be correct as of action date for a de-install, replace or move request, else the response xml will include the following error code.

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>73</error>
</skybitz>
```

The newmtsn field is required in a replace action. If one is missing or invalid, the response xml will include the following error code.

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>74</error>
</skybitz>
```

Install and Move actions will accept an optional Asset Type parameter. If one is provided and is not valid for the user, the following response xml will be generated.

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>75</error>
</skybitz>
```

If actiondate parameter is missing , invalid or is in the future ( If the time submitted is more than 30 mins in future with respect to our system time ) on any of the configure assets requests the following error code will be in the xml response. If the actionDate is within 30 mins in future with respect to our system time , system time will be used instead of the input actionDate

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
```

---

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```
<skybitz>  
  <error>76</error>  
</skybitz>
```

If asset type provided for a move request is invalid the response xml will include the following error code

```
<?xml version="1.0" ?>  
<!DOCTYPE skybitz (View Source for full doctype...)>  
<skybitz>  
  <error>77</error>  
</skybitz>
```

If the actiondate provided on any request causes the condition where an MT will exist on more than 1 Asset simultaneously, the response xml will contain the following error code.

```
<?xml version="1.0" ?>  
<!DOCTYPE skybitz (View Source for full doctype...)>  
<skybitz>  
  <error>78</error>  
</skybitz>
```

If the actiondate provided on any request causes more than 1 MT to exist on an Asset simultaneously the response xml will contain the following error code.

```
<?xml version="1.0" ?>  
<!DOCTYPE skybitz (View Source for full doctype...)>  
<skybitz>  
  <error>79</error>  
</skybitz>
```

If an invalid Asset ID ( refer to the <assetid> field for validation rules ) is provided on the request, the response xml will contain the following error code.

```
<?xml version="1.0" ?>  
<!DOCTYPE skybitz (View Source for full doctype...)>  
<skybitz>  
  <error>80</error>  
</skybitz>
```

If an invalid Asset Note ( must be less than 40 characters long) is provided on the request, the response xml will contain the following error code.

```
<?xml version="1.0" ?>  
<!DOCTYPE skybitz (View Source for full doctype...)>  
<skybitz>  
  <error>81</error>  
</skybitz>
```

If an unprocessed/pending conflicting configuration request exists for the mtsn or asset id, the response xml will contain the following error code.

```
<?xml version="1.0" ?>
```

---

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```
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>82</error>
</skybitz>
```

Customers who have opted to validate the optional asset note input parameter following a specific format (SkyBitz presently supports key/value pairs of details to be specified in this parameter). The following error is returned if a key name is present but there is no value specified is missing from the assetnote on an incoming Install MT Request.

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>84</error>
</skybitz>
```

Customers who have opted to validate the optional asset note input parameter following a specific format (SkyBitz presently supports key/value pairs of details to be specified in this parameter). The following error is returned if a key name is missing from the assetnote on an incoming Install MT Request.

```
<?xml version="1.0" ?>
<!DOCTYPE skybitz (View Source for full doctype...)>
<skybitz>
  <error>85</error>
</skybitz>
```

### 7.1.8 Groups Management Error Codes

Groups management Error codes are described below for individual operations:

103=No User(s) in Group

A request attempting to get users in a group or trying to delete users from a group could result in this error, when the group submitted has no users granted permissions to it.

104=No Asset(s) in Group

A request attempting to get assets of a group or trying to remove assets from a group could result in this error, when the group in question is empty.

105=Missing Group Name

Request expects a Group Name in input request but there was none found.

106=Duplicate Group Name

A request to add a group that violates unique group names for the customer account could result in this error.

107=Invalid Group Name

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A request with a group name that doesn't belong to the customer account would result in this error.

109=Missing User Name(s)

A request expecting user names to be present in the input , e.g., Adding Users to a Group, would result in this error if there are no user names provided in the input request.

110=Invalid User Name(s)

A request expecting user names to be present in the input , e.g., Adding Users to a Group, would result in this error if the user names provided in the input request don't belong to the customer account.

111=Missing AssetID(s)

A request expecting asset Ids to be present in the input , e.g., Adding AssetIDs to a Group, would result in this error if there are no asset Ids provided in the input request.

112=Invalid AssetID(s)

A request expecting asset Ids to be present in the input , e.g., Adding Asset Ids to a Group, would result in this error if the Asset ID(s) provided in the input request don't belong to the customer account.

Some Error Codes apply to the entire Request sent to the XML service instead of individual group operation requests. These are listed below:

102=Invalid Request

Input XML request is not formatted as expected. E.g., missing a closing tag for an element etc. Keep in mind that the tags are case-sensitive.

113=Maximum allowed groups for account exceeded

Customer Accounts are limited to having upto 250 Groups at a time. Requests causing this limit to be exceeded will result in this error.

114=XML Interface experiencing heavy usage from client

Too many requests coming in too frequently from clients will be rejected with this error to prevent DOS attacks.

115=Input XML Request exceeds size limit

The request size cannot exceed 30KB . If your request is bigger than this, consider submitting it as multiple requests.

116=Actions allowed per request exceeded limit

XML request containing multiple action requests cannot exceed more than 30 actions per request. On violation of this rule, the error will be sent back in the response. The first 29 requests will be attempted to be processed. If your request is bigger than this, consider submitting it as multiple requests.

### 7.1.9 MT Composite Actions Error Codes

300 – Invalid parameter for location and profile push start/stop. Both the parameters must be supplied and both the parameters should be set to 'stop' to end a current monitoring.

301 – Invalid parameter for profile change updates. This

302 – applabel must be 1 to 20 characters long

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- 303 – Missing applabel.
- 304 – Monitoring is already in progress for the MT. First Disable current monitoring to re-enable with different options.
- 305 – No monitoring in progress on a 'disable' monitoring request.
- 306 – Missing Reporting Profile Number
- 307 – Missing Wakeup Profile Number
- 308 – Invalid Reporting Profile Number
- 309 – Invalid Wakeup Profile Number
- 310 – Missing notification destination for Data Push
- 311 – Invalid Parameters for Actions in the composite command
- 312 – Range not allowed for Asset or MT S/N
- 313 – No Privilege to request Data Push. Refer to section 5.2 Setup Procedures for Data Push
- 314 – Missing Location Update Parameter
- 315 – Missing Profile Update Parameter
- 316 – Missing Parameters for Actions in the composite command

### 7.1.10 Query Mileage Error Codes

- 318 – Invalid value for optional mileage setup status parameter
- 319 – Missing or invalid date range for mileage lookup

### 7.1.11 Container Association Error Codes

- 320 – Invalid date/time for association request. Asset has an active container association at the given time

### 7.1.12 End Container Association Error Codes

- 321 – Invalid date/time for association request. Date/time must be after the current associated date/time and may not be in the future.
- 322 – Invalid date/time to end an association request. Date/time must be after the current associated date/time and may not be in the future.
- 323 – Association does not exist for the given Asset ID.
- 324 – Container ID length must be less than 20 characters
- 325 – SCAC must be less than 10 characters
- 326 – Trucking Company must be less than 50 characters
- 327 – Container Type must be less than 10 characters

## 8 Custom Interfaces

Due to the wide range of customer asset management systems currently in use, it is likely that customized methods of data exchange will be required. The architecture of the GLS SOC can

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support customized data exchange and these customized interfaces can be associated in a per customer fashion. The SOC database is an Oracle RDBMS and the SOC application server is on a BEA WebLogic platform. This combination supports multiple “middleware” methods for data exchange with customer systems.

## **9 Glossary**

DTD – Document Type Definition

IANA – Internet Assigned Number Authority

HTTP – Hypertext Transfer Protocol

HTTPS – Secure HyperText Transfer Protocol

MT – Mobile Terminal

RDBMS – Relational Database Management Systems

SOC – SkyBitz Operations Center

UTC – Coordinated Universal Time

XML – eXtensible Markup Language

## **10 Appendices**

### ***10.1 Appendix A – Common serial devices***

Cargo  
Container Detection  
Tractor ID  
Smart Tether  
Motion

(for some SkyBitz products – e.g., GLS – Motion will appear as a binary sensor)