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|  |  |
|  | """The \*\*splunklib.data\*\* module reads the responses from splunkd in Atom Feed |
|  | format, which is the format used by most of the REST API. |
|  | """ |
|  |  |
|  | from xml.etree.ElementTree import XML |
|  |  |
|  | \_\_all\_\_ = ["load"] |
|  |  |
|  | # LNAME refers to element names without namespaces; XNAME is the same |
|  | # name, but with an XML namespace. |
|  | LNAME\_DICT = "dict" |
|  | LNAME\_ITEM = "item" |
|  | LNAME\_KEY = "key" |
|  | LNAME\_LIST = "list" |
|  |  |
|  | XNAMEF\_REST = "{http://dev.splunk.com/ns/rest}%s" |
|  | XNAME\_DICT = XNAMEF\_REST % LNAME\_DICT |
|  | XNAME\_ITEM = XNAMEF\_REST % LNAME\_ITEM |
|  | XNAME\_KEY = XNAMEF\_REST % LNAME\_KEY |
|  | XNAME\_LIST = XNAMEF\_REST % LNAME\_LIST |
|  |  |
|  | # Some responses don't use namespaces (eg: search/parse) so we look for |
|  | # both the extended and local versions of the following names. |
|  |  |
|  | def isdict(name): |
|  | return name == XNAME\_DICT or name == LNAME\_DICT |
|  |  |
|  | def isitem(name): |
|  | return name == XNAME\_ITEM or name == LNAME\_ITEM |
|  |  |
|  | def iskey(name): |
|  | return name == XNAME\_KEY or name == LNAME\_KEY |
|  |  |
|  | def islist(name): |
|  | return name == XNAME\_LIST or name == LNAME\_LIST |
|  |  |
|  | def hasattrs(element): |
|  | return len(element.attrib) > 0 |
|  |  |
|  | def localname(xname): |
|  | rcurly = xname.find('}') |
|  | return xname if rcurly == -1 else xname[rcurly+1:] |
|  |  |
|  | def load(text, match=None): |
|  | """This function reads a string that contains the XML of an Atom Feed, then |
|  | returns the |
|  | data in a native Python structure (a ``dict`` or ``list``). If you also |
|  | provide a tag name or path to match, only the matching sub-elements are |
|  | loaded. |
|  |  |
|  | :param text: The XML text to load. |
|  | :type text: ``string`` |
|  | :param match: A tag name or path to match (optional). |
|  | :type match: ``string`` |
|  | """ |
|  | if text is None: return None |
|  | text = text.strip() |
|  | if len(text) == 0: return None |
|  | nametable = { |
|  | 'namespaces': [], |
|  | 'names': {} |
|  | } |
|  | root = XML(text) |
|  | items = [root] if match is None else root.findall(match) |
|  | count = len(items) |
|  | if count == 0: |
|  | return None |
|  | elif count == 1: |
|  | return load\_root(items[0], nametable) |
|  | else: |
|  | return [load\_root(item, nametable) for item in items] |
|  |  |
|  | # Load the attributes of the given element. |
|  | def load\_attrs(element): |
|  | if not hasattrs(element): return None |
|  | attrs = record() |
|  | for key, value in element.attrib.iteritems(): |
|  | attrs[key] = value |
|  | return attrs |
|  |  |
|  | # Parse a <dict> element and return a Python dict |
|  | def load\_dict(element, nametable = None): |
|  | value = record() |
|  | children = list(element) |
|  | for child in children: |
|  | assert iskey(child.tag) |
|  | name = child.attrib["name"] |
|  | value[name] = load\_value(child, nametable) |
|  | return value |
|  |  |
|  | # Loads the given elements attrs & value into single merged dict. |
|  | def load\_elem(element, nametable=None): |
|  | name = localname(element.tag) |
|  | attrs = load\_attrs(element) |
|  | value = load\_value(element, nametable) |
|  | if attrs is None: return name, value |
|  | if value is None: return name, attrs |
|  | # If value is simple, merge into attrs dict using special key |
|  | if isinstance(value, str): |
|  | attrs["$text"] = value |
|  | return name, attrs |
|  | # Both attrs & value are complex, so merge the two dicts, resolving collisions. |
|  | collision\_keys = [] |
|  | for key, val in attrs.iteritems(): |
|  | if key in value and key in collision\_keys: |
|  | value[key].append(val) |
|  | elif key in value and key not in collision\_keys: |
|  | value[key] = [value[key], val] |
|  | collision\_keys.append(key) |
|  | else: |
|  | value[key] = val |
|  | return name, value |
|  |  |
|  | # Parse a <list> element and return a Python list |
|  | def load\_list(element, nametable=None): |
|  | assert islist(element.tag) |
|  | value = [] |
|  | children = list(element) |
|  | for child in children: |
|  | assert isitem(child.tag) |
|  | value.append(load\_value(child, nametable)) |
|  | return value |
|  |  |
|  | # Load the given root element. |
|  | def load\_root(element, nametable=None): |
|  | tag = element.tag |
|  | if isdict(tag): return load\_dict(element, nametable) |
|  | if islist(tag): return load\_list(element, nametable) |
|  | k, v = load\_elem(element, nametable) |
|  | return Record.fromkv(k, v) |
|  |  |
|  | # Load the children of the given element. |
|  | def load\_value(element, nametable=None): |
|  | children = list(element) |
|  | count = len(children) |
|  |  |
|  | # No children, assume a simple text value |
|  | if count == 0: |
|  | text = element.text |
|  | if text is None: |
|  | return None |
|  | text = text.strip() |
|  | if len(text) == 0: |
|  | return None |
|  | return text |
|  |  |
|  | # Look for the special case of a single well-known structure |
|  | if count == 1: |
|  | child = children[0] |
|  | tag = child.tag |
|  | if isdict(tag): return load\_dict(child, nametable) |
|  | if islist(tag): return load\_list(child, nametable) |
|  |  |
|  | value = record() |
|  | for child in children: |
|  | name, item = load\_elem(child, nametable) |
|  | # If we have seen this name before, promote the value to a list |
|  | if value.has\_key(name): |
|  | current = value[name] |
|  | if not isinstance(current, list): |
|  | value[name] = [current] |
|  | value[name].append(item) |
|  | else: |
|  | value[name] = item |
|  |  |
|  | return value |
|  |  |
|  | # A generic utility that enables "dot" access to dicts |
|  | class Record(dict): |
|  | """This generic utility class enables dot access to members of a Python |
|  | dictionary. |
|  |  |
|  | Any key that is also a valid Python identifier can be retrieved as a field. |
|  | So, for an instance of ``Record`` called ``r``, ``r.key`` is equivalent to |
|  | ``r['key']``. A key such as ``invalid-key`` or ``invalid.key`` cannot be |
|  | retrieved as a field, because ``-`` and ``.`` are not allowed in |
|  | identifiers. |
|  |  |
|  | Keys of the form ``a.b.c`` are very natural to write in Python as fields. If |
|  | a group of keys shares a prefix ending in ``.``, you can retrieve keys as a |
|  | nested dictionary by calling only the prefix. For example, if ``r`` contains |
|  | keys ``'foo'``, ``'bar.baz'``, and ``'bar.qux'``, ``r.bar`` returns a record |
|  | with the keys ``baz`` and ``qux``. If a key contains multiple ``.``, each |
|  | one is placed into a nested dictionary, so you can write ``r.bar.qux`` or |
|  | ``r['bar.qux']`` interchangeably. |
|  | """ |
|  | sep = '.' |
|  |  |
|  | def \_\_call\_\_(self, \*args): |
|  | if len(args) == 0: return self |
|  | return Record((key, self[key]) for key in args) |
|  |  |
|  | def \_\_getattr\_\_(self, name): |
|  | try: |
|  | return self[name] |
|  | except KeyError: |
|  | raise AttributeError(name) |
|  |  |
|  | def \_\_delattr\_\_(self, name): |
|  | del self[name] |
|  |  |
|  | def \_\_setattr\_\_(self, name, value): |
|  | self[name] = value |
|  |  |
|  | @staticmethod |
|  | def fromkv(k, v): |
|  | result = record() |
|  | result[k] = v |
|  | return result |
|  |  |
|  | def \_\_getitem\_\_(self, key): |
|  | if key in self: |
|  | return dict.\_\_getitem\_\_(self, key) |
|  | key += self.sep |
|  | result = record() |
|  | for k,v in self.iteritems(): |
|  | if not k.startswith(key): |
|  | continue |
|  | suffix = k[len(key):] |
|  | if '.' in suffix: |
|  | ks = suffix.split(self.sep) |
|  | z = result |
|  | for x in ks[:-1]: |
|  | if x not in z: |
|  | z[x] = record() |
|  | z = z[x] |
|  | z[ks[-1]] = v |
|  | else: |
|  | result[suffix] = v |
|  | if len(result) == 0: |
|  | raise KeyError("No key or prefix: %s" % key) |
|  | return result |
|  |  |
|  |  |
|  | def record(value=None): |
|  | """This function returns a :class:`Record` instance constructed with an |
|  | initial value that you provide. |
|  |  |
|  | :param `value`: An initial record value. |
|  | :type `value`: ``dict`` |
|  | """ |
|  | if value is None: value = {} |
|  | return Record(value) |