Bug #12642: Net::HTTP populates host header incorrectly when using an IPv6 Address

When sending a request, the client code adds a "Host" header. It does the by taking the given address, appending a colon, and then appending the port. This creates a fragment of a URL such as "google.com:80". However, when instead of "google.com", the address is an IPv6 address is given (such as 8383:3223::1333:DE12), simply appending a colon is not adequate. It yields 8383:3223::1333:DE12:80, which is hard to parse mess.

RFC3986 stipulates that the host should be surrounded by square brackets, which would have the Host header as: [8383:3223::1333:DE12]:80.

Revision 3acc0ba1 - 10/26/2017 03:29 PM - naruse (Yui NARUSE)
Host header should add brackets to IPv6 address [Bug #12642]

Revision 60455 - 10/26/2017 03:29 PM - naruse (Yui NARUSE)
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History
#1 - 03/14/2017 10:57 PM - andy (Andy Brody)
- File ipv6_test.rb added

#2 - 03/14/2017 11:04 PM - andy (Andy Brody)
- File ipv6_test.rb added

Missing brackets from Host header for IPv6 addresses

This is a regression from Ruby 2.1. The bug appears to have been introduced in ruby 2.2.0 by this commit: https://github.com/ruby/ruby/commit/70a2eb63999265ff7e8d46d1f5b410c8e3e3d30d7

The change was added in response to this bug: https://bugs.ruby-lang.org/issues/10054

Attached is a test script demonstrating the bug "ipv6_test.rb".

Correct behavior (present in 2.0 from 2.0.0-p643 onward and in 2.1 from 2.1.6 onward) for sending a request to http://[:1]:8080

Host: [:1]:8080

Incorrect behavior (present in 2.2.0 through trunk)

Host: ::1:8080

See also https://github.com/rest-client/rest-client/issues/583
I've added tests for rest-client that show the affected Ruby versions. Net::HTTP support for IPv6 URIs was broken in 2.0 before 2.0.0-p643 and 2.1 before 2.1.6, so there is a narrow window of versions that work.

Full test output is here: https://travis-ci.org/rest-client/rest-client/builds/211090377

**Broken handling of explicit IPv6 Host header**

There is a separate bug that makes it impossible to explicitly set an IPv6 host header in affected ruby versions. Because Net::HTTP slices the end of the provided Host header after the first :, an IPv6 Host header will be rendered invalid.

If you attempt to set req['Host'] = '[::1]:8080', it will be rendered as [ due to https://github.com/ruby/ruby/blob/v2_4_0/lib/net/generic_request.rb#L144

```ruby
$ ruby ipv6_test.rb --set-host
```

```ruby
/breadcrumbs/versions/2.3.1/lib/ruby/2.3.0/uri/generic.rb:595:in `check_host': bad component(expected host component): [ (URI::InvalidComponentError)
  from /versions/2.3.1/lib/ruby/2.3.0/uri/generic.rb:636:in `host='
  from /versions/2.3.1/lib/ruby/2.3.0/net/http/generic_request.rb:151:in `update_uri'
  from /versions/2.3.1/lib/ruby/2.3.0/net/http.rb:1493:in `begin_transport'
  from /versions/2.3.1/lib/ruby/2.3.0/net/http.rb:1433:in `transport_request'
  from /versions/2.3.1/lib/ruby/2.3.0/net/http.rb:1407:in `request'
  from ipv6_test.rb:42:in `block in <main>'
  from /versions/2.3.1/lib/ruby/2.3.0/net/http.rb:853:in `start'
```

#3 - 03/14/2017 11:05 PM - andy (Andy Brody)
- File deleted (ipv6_test.rb)

#4 - 04/17/2017 07:36 AM - naruse (Yui NARUSE)
- Assignee set to naruse (Yui NARUSE)

#5 - 04/28/2017 01:45 PM - shyouhei (Shyouhei Urabe)
- Status changed from Open to Assigned

#6 - 06/03/2017 01:07 AM - anuraguniyal (anurag uniyal)
Is there a workaround for this? How should we connect to ipv6 servers?

#7 - 06/05/2017 09:32 PM - anuraguniyal (anurag uniyal)
Below monkey patching code works for me. Is there a better way?

```ruby
module MonkeyPatch
  module Net
    module HTTP
      # workaround for https://bugs.ruby-lang.org/issues/12642
      # Ruby does not pass Host header with brackets if host is ipv6 address
      def addr_port
        addr = address
        # if it is ipv6 add brackets around it
        if addr =~ Resolv::IPv6::Regex
          addr = "[#{addr}]"
        end
        # if use_ssl?
        if use_ssl?
          addr + (port == Net::HTTP.https_default_port ? '' : "#{port()}")
        else
          addr + (port == Net::HTTP.http_default_port ? '' : "#{port()}")
        end
      end
    end
  end
end

Net::HTTP.prepend(MonkeyPatch::Net::HTTP)
```

#8 - 10/26/2017 03:29 PM - naruse (Yui NARUSE)
- Status changed from Assigned to Closed
Host header should add brackets to IPv6 address [Bug #12642]

Files

<table>
<thead>
<tr>
<th>File</th>
<th>Size</th>
<th>Date</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv6_test.rb</td>
<td>1.17 KB</td>
<td>03/14/2017</td>
<td>andy (Andy Brody)</td>
</tr>
</tbody>
</table>