



FIRST TECH®

Construindo relações duradouras

Comando L6

Índice

1. HSM	3
1.1. LMK.....	3
1.2. ZMK.....	3
2. OpenSSL.....	4
3. Tools.....	6
3.1. Crypto - Ajuste.....	6
3.2. BPTools - criptografia	8
3.3. Crypto - criptografia	9
4. Comando.....	11
4.1. L6	11
4.2. L7	12
5. Release Notes	13

1. HSM

1.1. LMK

Online-AUTH>vt

LMK table:

ID	Authorized	Scheme	Algorithm	Status	Check	Comments
00	Yes(H,C)	Variant	3DES(2key)	Test	268604	variant

Key change storage table: No keys loaded in key change storage

1.2. ZMK

Componente

Online-AUTH>gc

Enter LMK id [0-1]: 0

Enter key length [1,2,3]: 3

Enter key type: 000

Enter key scheme: t

Clear component: **E008 4FE3 5E83 6E2A 0154 0102 BF01 540B 1FBC 70B3 D01F 1FC7**

Encrypted component: TC159 C0B6 BEAE 4851 3634 0788 6D31 8963 F578 F585 CCF2 37D8

Key check value: 550B57

Chave

Online-AUTH>fk

Enter LMK id [0-1]: 0

Enter key length [1,2,3]: 3

Enter key type: 000

Enter key scheme: t

Enter component type [X,H,T,E,S]: x

Enter number of components [1-9]: 1

Enter component 1: *****

Component 1 check value: 550B57

Continue? [Y/N]: y

Encrypted key: **T4A49 3C7E 7F5D 6ABB 05D7 D93E DD90 0E6D 8CB4 8D3D A427 CFDA**

Key check value: 550B57

2. OpenSSL

Gerar par de chave RSA

```
openssl genrsa -aes128 -passout pass:12345 -out rsakey.pem 2048
```

Exibir dados da chave RSA

```
openssl pkey -in rsakey.pem -passout pass: -text

modulus(chave pública):
00:bc:b5:14:72:96:57:7b:c5:54:0c:39:46:95:7d:
20:7a:20:8e:90:cf:84:45:f4:5b:fe:45:b2:9b:f0:
96:4f:e4:08:aa:68:b5:8c:16:38:30:12:67:10:74:
1e:65:f1:d4:12:b2:83:99:36:f9:ef:32:25:79:4d:
7e:52:35:fb:f1:99:b5:00:8d:97:92:bb:4d:3e:80:
a3:62:d1:fc:64:a0:7b:b0:9e:b8:76:c8:0e:35:53:
eb:b3:90:3e:ee:ef:06:74:73:57:8c:d1:c0:7f:c3:
b4:60:7d:63:8c:9f:99:af:87:f9:7b:87:32:c3:fb:
1d:2c:39:aa:f8:38:e8:5f:65:40:27:42:e9:5e:e3:
ee:9e:c8:5e:a8:47:0e:9f:1a:23:58:87:d7:67:b4:
17:7c:92:0b:6f:26:58:10:d2:74:f6:d1:a8:bd:a5:
68:72:b9:e5:17:1e:d6:67:dd:22:7b:c6:24:10:72:
f6:97:78:b7:02:9b:a9:5f:28:0f:fd:c6:57:5a:2e:
4a:1f:9f:be:d4:c9:57:ee:af:c0:fd:4c:40:65:41:
df:51:0b:03:ce:26:d2:b1:97:19:45:57:1b:5c:b9:
79:32:f1:9e:8e:8d:d8:62:45:9d:d5:e6:68:47:18:
da:2d:37:a6:ce:db:af:63:02:22:0d:f3:b7:6b:bc:
78:01

(...)
prime1(P):
00:f4:15:87:a6:fe:2f:47:c3:c4:c7:d0:19:cf:64:
a4:2b:3f:ad:ea:08:4e:a6:8f:53:1b:01:3c:b0:9f:
d3:7c:60:10:d0:f3:fd:e6:b1:a6:a2:c2:a9:bc:60:
ba:d1:4a:e2:be:a0:31:36:63:4b:f4:eb:30:f9:8e:
f5:dd:03:81:d2:a4:6c:3f:ef:8c:cb:1d:ac:4b:73:
8b:89:f4:6a:c8:b5:dc:a4:3e:f0:75:93:23:4a:fb:
76:95:bb:11:91:95:f0:bf:bd:77:26:da:4f:06:74:
2b:8d:b7:68:d1:c5:b5:80:ff:f5:43:47:c2:cf:64:
25:74:a5:cd:a2:b2:02:3d:f9

prime2(Q):
00:c5:eb:78:ec:78:9f:c7:5e:70:b5:42:9e:08:52:
f5:19:4b:b7:24:f2:3a:23:0d:c0:19:b9:a7:6b:bf:
62:c7:ae:94:e4:ad:9f:48:da:e4:c8:5a:4f:aa:7e:
11:cd:2e:66:5a:89:14:92:32:91:41:59:9d:fd:7a:
78:b7:6b:b6:46:97:44:ee:a2:0c:f6:19:ec:80:4c:
07:ff:3c:8b:46:75:ca:13:e8:f8:94:a3:ef:a6:ce:
8d:bc:e8:ad:fa:39:01:31:da:6e:ac:d9:09:19:a2:
dd:eb:d3:6c:80:48:43:03:1c:b9:38:37:58:b2:58:
9c:44:b8:25:58:be:82:2c:49
```

exponent1(DP):

00:e3:37:67:a0:3c:df:26:9f:47:7f:fa:69:0c:77:
53:9c:2f:1b:66:d1:74:e5:f8:66:14:ad:82:21:a9:
a6:e6:11:47:96:3c:8c:0f:45:31:2a:32:ac:6f:80:
5c:68:98:9d:9b:76:e4:59:0c:f6:98:78:98:8e:b8:
56:87:f7:cb:d2:9a:dd:6a:67:45:59:8f:b5:e4:47:
1b:8e:c0:c8:e7:2e:e4:c6:c1:10:77:63:11:67:ab:
cf:28:73:8c:57:4a:8d:62:f0:ad:0a:ae:0f:02:a3:
02:28:5a:a4:69:22:f3:63:b2:e2:4e:4f:6f:3a:40:
af:dd:76:bb:86:c8:ce:ed:81

exponent2(DQ):

00:9b:fd:94:28:24:86:21:f7:70:33:9c:96:bb:8e:
ce:b8:aa:31:65:c0:38:4c:0a:79:5e:8d:31:c4:3d:
6a:98:61:23:de:fc:6c:af:5a:3e:b9:1e:5c:ed:ce:
41:2f:8b:23:86:b5:c5:ed:d8:47:1d:cf:89:33:10:
04:f6:e3:c1:1c:ef:fa:97:6e:47:72:ec:49:b7:70:
b5:58:d8:9a:18:e5:9b:68:87:d4:ec:2a:2d:27:36:
63:06:02:09:a5:4e:aa:7f:65:5e:97:82:d3:a6:4d:
f4:44:fb:34:e8:02:8c:36:76:bc:10:ef:a6:4b:a2:
85:3f:b0:37:57:33:87:9b:69

Coefficiente(U):

22:1e:95:23:ee:0a:65:ee:47:6f:7a:7b:22:a1:cf:
00:98:9a:ab:ec:63:9e:3e:86:72:95:0d:f0:82:10:
95:cb:3f:9a:b7:bb:40:24:d0:bf:52:97:89:87:1f:
87:5b:f9:eb:bf:b4:d3:cf:ce:92:d3:69:84:a7:f1:
8b:db:b7:9e:d6:41:53:bc:0a:7a:24:5d:ea:6a:ff:
d1:34:b6:90:88:88:78:23:d3:69:25:3b:64:cf:84:
a9:43:85:96:c5:6d:07:af:1b:96:14:17:95:b8:49:
ea:2b:3d:00:30:b3:08:ad:42:ef:b7:58:36:ec:b4:
93:01:56:03:c4:a8:a4:20

3. Tools

3.1. Crypto - Ajuste



Modulus (chave pública):

```
BCB5147296577BC5540C3946957D207A208E90CF8445F45BFE45B29BF0964FE408AA68B58C163830
126710741E65F1D412B2839936F9EF3225794D7E5235F8F199B5008D9792BB4D3E80A362D1FC64A0
7BB09EB876C80E3553EBB3903EEEEF067473578CD1C07FC3B4607D638C9F99AF87F97B8732C3FB1D
2C39AAF838E85F65402742E95EE3EE9EC85EA8470E9F1A235887D767B4177C920B6F265810D274F6
D1A8BDA56872B9E5171ED667DD227BC6241072F69778B7029BA95F280FFDC6575A2E4A1F9FBED4C9
57EEAFC0FD4C406541DF510B03CE26D2B1971945571B5CB97932F19E8E8DD862459DD5E6684718DA
D237A6CEDBAF6302220DF3B76BBC7801
```

P (em claro)

```
F41587A6FE2F47C3C4C7D019CF64A42B3FADEA084EA68F531B013CB09FD37C6010D0F3FDE6B1A6A2
C2A9BC60BAD14AE2BEA03136634BF4EB30F98EF5DD0381D2A46C3FEF8CCB1DAC4B738B89F46AC8B5
DCA43EF07593234AFB7695BB119195F0BFBD7726DA4F06742B8DB768D1C5B580FFF54347C2CF6425
74A5CDA2B2023DF9
```

Q (em claro)

```
C5EB78EC789FC75E70B5429E0852F5194BB724F23A230DC019B9A76BBF62C7AE94E4AD9F48DAE4C8
5A4FAA7E11CD2E665A891492329141599DFD7A78B76BB6469744EEA20CF619EC804C07FF3C8B4675
CA13E8F894A3EFA6CE8DBCE8ADFA390131DA6EACD90919A2DDEBD36C804843031CB9383758B2589C
44B82558BE822C49
```

DP (em claro)

```
E33767A03CDF269F477FFA690C77539C2F1B66D174E5F86614AD8221A9A6E61147963C8C0F45312A
32AC6F805C68989D9B76E4590CF69878988EB85687F7CBDD29ADD6A6745598FB5E4471B8EC0C8E72E
E4C6C11077631167ABCF28738C574A8D62F0AD0AAE0F02A302285AA46922F363B2E24E4F6F3A40AF
DD76BB86C8CEED81
```

DQ (em claro)

```
9BFD9428248621F770339C96BB8ECEB8AA3165C0384C0A795E8D31C43D6A986123DEFC6CAF5A3EB9
1E5CEDCE412F8B2386B5C5EDD8471DCF89331004F6E3C11CEFFA976E4772EC49B770B558D89A18E5
9B6887D4EC2A2D273663060209A54EAA7F655E9782D3A64DF444FB34E8028C3676BC10EFA64BA285
3FB0375733879B69
```

U (em claro)

221E9523EE0A65EE476F7A7B22A1CF00989AABEC639E3E8672950DF0821095CB3F9AB7BB4024D0BF
529789871F875BF9EBBF4D3CFCE92D36984A7F18BDBB79ED64153BC0A7A245DEA6AFFD134B69088
887823D369253B64CF84A9438596C56D07AF1B96141795B849EA2B3D0030B308AD42EFB75836ECB4
93015603C4A8A420

3.2. BPTools - criptografia

BP-Tools - Cryptographic Calculator 21.03

Main Generic Cipher Keys Payments EMV Development

DES / 3DES

Algorithm

☐ DES ☒ 3DES

Mode

☒ ECB ☐ CBC ☐ CFB-8 ☐ CFB-64 ☐ OFB-8 ☐ OFB-64

Data input

☐ ASCII ☒ Hexadecimal

Padding:

None

Key:

ZMK EM CLARO

[0]

Data:

D, P, Q, DP, DQ, U

[0]

IV:

1234567890123456

[16]

3.3. Crypto - criptografia

Crypto! V1.12 - SETIS Automação e Sistemas (www.setis.com.br)

Input: 0 bytes

P, Q, DP, DQ, U

Key (24 bytes): 0 bytes

ZMK em claro

Output: 0 bytes

Triple-DES/K24 (ECB)

GO!

SETIS

Adjust

Adjust

Adjust

Copy to Input

P (criptografado pela ZMK em claro)

4D72E4F85C11A1F0FA673468E3C3E414FA3BC315A8C2201D9B1357AF156D2AD28238B7F60E6BC633
5B3FFB4F93E149364E268AA61B244219E30EE4C477B35E744A108CC615BE37E810CBD5DE0F8E1EB7
FBD1B2B647EABEC08D9954EB5BE35DFDBEF5117675937610D65577B07F9244E9390CFCC4E87C38D8
453AA6825601A69B

Q (criptografado pela ZMK em claro)

1EB29E53FE6D8A06CA2FE679558083CE4B825DDEC5BA0F8FD7CA0F86F1E260C6ED77E4D4C1C3EDBF
09F4917B0EB2C2668A84163943AD089BB071E0C6026FA695DBDFAC77A74BB789163927FE4628D188
813026059390B25F37BCE4678648683B71E74B2BB32CC93F2F9C0B52D0328C4DF5E52A8E0A9160D2
7F286694C86DF325

DP (criptografado pela ZMK em claro)

1854AFC4932533281D2337E9CA36C439B8E71FC7F55EE7391C3A3F1AFA422F740ABE135F5912C083
CA8A42CA8C28F346B2A626EACEFF4F3A9574D22F0A9E89D6CFAB0FACF099FE20DDDE790BB6D65089
7FF0E83A7A225ADCE10D1293C72F10ABB78E6594C5CB48C7158DFA6CC4C788F41F507F69E4B2D176
86FC26B8F818B443

DQ (criptografado pela ZMK em claro)

4FB8EEDA5E5CE3A29EAB1B913987CE6D3C3E07C344913DF87D9C99A68FAA3BEF8A8F154AAC9C335E
860E6B004C49BC0399F1E1F1160A1B9BDCE32245521F482B50B1DA06AABD8E954494E9E717B33304
6EE78386E4836CDE7065A130C29A8343EC0207A892C4183974E3AD880722211B74BDA0A1965108B5
952653A5B3040E22

U (criptografado pela ZMK em claro)

7E2A8DFA7E4010ADBD88BAB23983CA9F6B70FAA5F5775F8F37569C207375810CD028DB0CDD0EB42
90D1A38D704E779FE677433EF282B87FCA141BD57BC30692B1B253C49941BDF93F3BB8A057981218
E30433DEA6F21C90F26C6297689632E42B5729211089753E8DB948E78C0B8D20471B74EE27162AAD
218016EC2BBED808

4. Comando

4.1. L6

Message Header	0000
Command Code	L6
ZMK	T4A493C7E7F5D6ABB05D7D93EDD900E6D8CB48D3DA427CFDA
Key Format	0
Block Cipher Mode	0
Pad mode	1
Private key length	0280
Private key	<p><4D72E4F85C11A1F0FA673468E3C3E414FA3BC315A8C2201D9B1357AF156D2AD28238B7F6 0E6BC6335B3FFB4F93E149364E268AA61B244219E30EE4C477B35E744A108CC615BE37E810CBD5DE 0F8E1EB7FBD1B2B647EABEC08D9954EB5BE35DFDBEF5117675937610D65577B07F9244E9390CFCC4 E87C38D8453AA6825601A69B1EB29E53FE6D8A06CA2FE679558083CE4B825DDEC5BA0F8FD7CA0F86 F1E260C6ED77E4D4C1C3EDBF09F4917B0EB2C2668A84163943AD089BB071E0C6026FA695DBDFAC77 A74BB789163927FE4628D188813026059390B25F37BCE4678648683B71E74B2BB32CC93F2F9C0B52 D0328C4DF5E52A8E0A9160D27F286694C86DF3251854AFC4932533281D2337E9CA36C439B8E71FC7 F55EE7391C3A3F1AFA422F740ABE135F5912C083CA8A42CA8C28F346B2A626EACEFF4F3A9574D22F 0A9E89D6CFAB0FACF099FE20DDDE790BB6D650897FF0E83A7A225ADCE10D1293C72F10ABB78E6594 C5CB48C7158DFA6CC4C788F41F507F69E4B2D17686FC26B8F818B4434FB8EEDA5E5CE3A29EAB1B91 3987CE6D3C3E07C344913DF87D9C99A68FAA3BEF8A8F154AAC9C335E860E6B004C49BC0399F1E1F1 160A1B9BDCE32245521F482B50B1DA06AABD8E954494E9E717B333046EE78386E4836CDE7065A130 C29A8343EC0207A892C4183974E3AD880722211B74BDA0A1965108B5952653A5B3040E227E2A8DFA 7E4010ADBD88BAB23983CA9F6B70FAA5F5775F8F37569C207375810CD028DB0CDD0EB4290D1A38D 704E779FE677433EF282B87FCA141BD57BC30692B1B253C49941BDF93F3BB8A057981218E30433DE A6F21C90F26C6297689632E42B5729211089753E8DB948E78C0B8D20471B74EE27162AAD218016EC 2BBED808></p>
Validate	1
Public Key length	0100
Public Key	<p><BCB5147296577BC5540C3946957D207A208E90CF8445F45BFE45B29BF0964FE408AA68B5 8C163830126710741E65F1D412B2839936F9EF3225794D7E5235FBF199B5008D9792BB4D3E80A362 D1FC64A07BB09EB876C80E3553EBB3903EEEEF067473578CD1C07FC3B4607D638C9F99AF87F97B87 32C3FB1D2C39AAF838E85F65402742E95EE3EE9EC85EA8470E9F1A235887D767B4177C920B6F2658 10D274F6D1A8BDA56872B9E5171ED667DD227BC6241072F69778B7029BA95F280FFDC6575A2E4A1F 9FBED4C957EEAFC0FD4C406541DF510B03CE26D2B1971945571B5CB97932F19E8E8DD862459DD5E6 684718DA2D37A6CEDBAF6302220DF3B76BBC7801></p>
Public Exponent Length	0003
Public Exponent	<010001>
Delimiter	%
LMK Identifier	00
Command	<p>0000L6T4A493C7E7F5D6ABB05D7D93EDD900E6D8CB48D3DA427CFDA0010280<4D72E4F85C 11A1F0FA673468E3C3E414FA3BC315A8C2201D9B1357AF156D2AD28238B7F60E6BC6335B3FFB4F93 E149364E268AA61B244219E30EE4C477B35E744A108CC615BE37E810CBD5DE0F8E1EB7FBD1B2B647 EABEC08D9954EB5BE35DFDBEF5117675937610D65577B07F9244E9390CFCC4E87C38D8453AA68256 01A69B1EB29E53FE6D8A06CA2FE679558083CE4B825DDEC5BA0F8FD7CA0F86F1E260C6ED77E4D4C1 C3EDBF09F4917B0EB2C2668A84163943AD089BB071E0C6026FA695DBDFAC77A74BB789163927FE46 28D188813026059390B25F37BCE4678648683B71E74B2BB32CC93F2F9C0B52D0328C4DF5E52A8E0A 9160D27F286694C86DF3251854AFC4932533281D2337E9CA36C439B8E71FC7F55EE7391C3A3F1AFA 422F740ABE135F5912C083CA8A42CA8C28F346B2A626EACEFF4F3A9574D22F0A9E89D6CFAB0FACF0 99FE20DDDE790BB6D650897FF0E83A7A225ADCE10D1293C72F10ABB78E6594C5CB48C7158DFA6CC4 C788F41F507F69E4B2D17686FC26B8F818B4434FB8EEDA5E5CE3A29EAB1B913987CE6D3C3E07C344 913DF87D9C99A68FAA3BEF8A8F154AAC9C335E860E6B004C49BC0399F1E1F1160A1B9BDCE3224552 1F482B50B1DA06AABD8E954494E9E717B333046EE78386E4836CDE7065A130C29A8343EC0207A892 C4183974E3AD880722211B74BDA0A1965108B5952653A5B3040E227E2A8DFA7E4010ADBD88BAB239</p>

```
83CA9F6B70FAA5F5775F8F37569C207375810CD028DB0CDD0EB4290D1A38D704E779FE677433EF2
82B87FCA141BD57BC30692B1B253C49941BDF93F3BB8A057981218E30433DEA6F21C90F26C629768
9632E42B5729211089753E8DB948E78C0B8D20471B74EE27162AAD218016EC2BBED808>10100<BCB
5147296577BC5540C3946957D207A208E90CF8445F45BFE45B29BF0964FE408AA68B58C163830126
710741E65F1D412B2839936F9EF3225794D7E5235FBF199B5008D9792BB4D3E80A362D1FC64A07BB
09EB876C80E3553EBB3903EEEEF067473578CD1C07FC3B4607D638C9F99AF87F97B8732C3FB1D2C3
9AAF838E85F65402742E95EE3EE9EC85EA8470E9F1A235887D767B4177C920B6F265810D274F6D1A
8BDA56872B9E5171ED667DD227BC6241072F69778B7029BA95F280FFDC6575A2E4A1F9FBED4C957E
EAFCD0FD4C406541DF510B03CE26D2B1971945571B5CB97932F19E8E8DD862459DD5E6684718DA2D3
7A6CEDBAF6302220DF3B76BBC7801>0003<010001>%00
```

4.2. L7

Received response:

```
0000L700[303239304E8376A6904DAD4747BB21F662A385FFC0B17903F8199BB43D10DF4C2C87016
20EA694BACA7303AF0FB9F45002069858D389202D7BD415D609EEEB32BB5CD4FC485D8037939C34F
F736CEC935DE0615A8FB617506E8F8638EA499BA32DBFF583D9EA15BDBC6EA41C5E642CCE12965CC
FE9D017F23C5795090158ADB2AE92F934192F772FEB8335F4E3DAC35054357BF9F50F534FDA28D2A
BDD344DBC42B6C3018D191643BCDD7DA7800D8EBA9D321E4958A616429EFA5145F7B9359F685F320
24EB77FC5BC03E35C99C06D41729FD30B8A8302B1A28B063805DBC9236B41CFF6FC692EF6D22D658
1212BBAE11A2B47AE99E4B069EF255B3C3E54E3D23FCE796B9B1829917CF55993305374E8F2EC1DB
2ECF90A03E3D97C1189EBE90C9263DA192DDB1DAB935787A69D7035C626DD7A1E4A1B9EEFE3E50FB
2A36A19C081ABC6041C4BE7374EA018CB98AC24D8858117E351C5B2124F18B91A645D4476EC4BA6C
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349A85E48819564D727BB23EEB6603115CE92A918B169DBE510C1AA79AF26C4DE9AA89DC3E3D3650
9C2BD51BFEEFA6B211AE25A6FE8A6EC1746CA343E7FBE1B2837855E70026F742A17EC5B30CAF148AA
180FCDE964E379522EEFA686FE69EDD63DE276223E44323746255936F30368DED901D4BCA808B19C
0731EE807347295057B249A65761E6378CBEC62298D51B02AA5D5039EDC69580C413B9457C8FEC3E
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Message Header	0000
Response Command	L7
Error Code	00
Private Key Length	30323930 (0290)
Private Key	

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DE0615A8FB617506E8F8638EA499BA32DBFF583D9EA15BDBC6EA41C5E642CCE12965CCFE9D017F23
C5795090158ADB2AE92F934192F772FEB8335F4E3DAC35054357BF9F50F534FDA28D2ABDD344DBC4
2B6C3018D191643BCDD7DA7800D8EBA9D321E4958A616429EFA5145F7B9359F685F32024EB77FC5B
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3D97C1189EBE90C9263DA192DDB1DAB935787A69D7035C626DD7A1E4A1B9EEFE3E50FB2A36A19C08
1ABC6041C4BE7374EA018CB98AC24D8858117E351C5B2124F18B91A645D4476EC4BA6CE1116F8950
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FA6B211AE25A6FE8A6EC1746CA343E7FBE1B2837855E70026F742A17EC5B30CAF148AA180FCDE964
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5. Release Notes

Autor	Descrição	Data
Caio Ferreira	Primeira versão	05/04/2021
Eduardo Campo	Revisão	05/04/2021