

## DNSSEC Key Ceremony Script Friday, January 10, 2014

### Sign In to Facility

Step	Activity	Initial	Time (PDT)
1	FO has all participants sign in on Facility Sign-In Sheet before entering the Key Management Facility		
2	FO reviews emergency evacuation procedures and other relevant information with participants		
3	FO collects cell phones, laptops, etc. Cameras are permitted in the Key Management Facility.		
4	FO verifies the functioning of audio and video recording.		

### Enter the Key Management Facility

Step	Activity	Initial	Time (PDT)
5	<p>As the participants enter the Key Management Facility, the EW verifies the identity of each by examining a government-issued photo identification, notes the type and number of each piece of identification, and the participant's entry time on the Participant Signature Sheet.</p> <p>Note that participants do not sign the sheet until the end of the ceremony.</p> <p>As the participants are identified, the EW distributes their role identification placards, for them to wear.</p>		

Ground Rules

Step	Activity	Initial	Time (PDT)
6	CA previews ground rules and break procedures with participants.		

Verify Time and Date

Step	Activity	Initial	Time (PDT)
7	<p>EW reads aloud and records the date (month/day/year) and time (UTC) using an NTP-synchronized clock visible to all. Participants verify that the time is correct.</p> <p>Date: _____</p> <p>Time: _____</p> <p>This and all subsequent entries into this script and any associated logs should follow this common source of time.</p>		

Remove Equipment from Safe

Step	Activity	Initial	Time (UTC)
8	SC opens safe and makes entry in log sheet indicating opening of safe.		
9	<p>SC collects the following items from the safe:</p> <ul style="list-style-type: none"> <li>- KSK-HSM-01B-SJC HSM</li> <li>- boot-DVD</li> <li>- laptop</li> <li>- KSK-HSM-01B-SJC HSMFD</li> </ul> <p>and any other items that may be scheduled for removal indicating removal of each with corresponding TEB number of safe log. SC also provides any necessary power supplies and cables. Equipment is placed on table visible to all participants.</p>		

10	CA reads out KSK-HSM-01B-SJC HSM TEB and serial number while EW checks that it matches the TEB # recorded in the script from the previous key ceremony.  TEB# A3112573  Serial# K1011066		
11	CA similarly reads out boot-DVD, laptop, and HSMFD TEB numbers while EW checks that they match the TEB # in the script from the previous key ceremony.  DVD TEB# A28410794  Laptop TEB# A3112574  HSMFD KSK-HSM-01B-SJC TEB# A28410795		

## Collect OP Cards

Step	Activity	Initial	Time (UTC)
12	CA collects OP cards from COs, reading out and comparing TEB numbers with those recorded in the prior ceremony, reproduced for convenience in the appendices of this document. Different COs may appear on different pages. Note any discrepancies. CA places the OP cards in plain view on the table, removing cards from TEBs, discarding used TEBs but saving warning slips for reuse.		

## Set Up Laptop

Step	Activity	Initial	Time (UTC)
13	CA places the boot-DVD and laptop on the table; connects laptop power to grid (or UPS if available) and external monitor or projector and boots laptop from DVD.  Bootting from CD may generate warnings of kernel crash, which can be ignored if it keeps on booting.		
14	CA logs in as root.		
15	CA opens a terminal window.		

16	<p>CA verifies the time zone, date, and time on the laptop and synchronizes it if necessary.</p> <p>Display the current time and timezone:</p> <pre>date</pre> <p>If the timezone is not set to UTC:</p> <pre>cd /etc/ rm localtime ln -s /usr/share/zoneinfo/UTC localtime</pre> <p>Set time to match the wall clock:</p> <pre>date mmddHHMMYYYY</pre> <p>Verify:</p> <pre>date</pre>		
17	<p>CA disables screen saver by using the GUI menu.</p>		
18	<p>CA calculates sha256 checksum of the boot-DVD. CA may proceed with additional steps while this process completes (approx 9 minutes). When the checksum is complete, CA reads it aloud, four digits at a time. Then closes the terminal window.</p> <pre>sha256sum /dev/cdrom</pre>		
19	<p>EW records the sixty-four digit boot-DVD checksum</p> <pre>_____</pre> <pre>_____</pre> <pre>_____</pre> <pre>_____</pre> <p>Other participants may compare this with the boot-DVD checksum calculated during Key Ceremony 1, reproduced for convenience in the appendices of this document.</p>		
20	<p>CA connects USB hub to laptop.</p>		
21	<p>CA removes HSMFD KSK-HSM-01B-SJC from TEB, connects it to the laptop, and waits for O/S to recognize the FD. CA lets participants view contents of HSMFD then closes FD window.</p>		

## Start Logging Terminal Session

Step	Activity	Initial	Time (UTC)
22	<p>CA opens new terminal window.</p> <p>CA changes the default directory to the HSMFD and starts capture of terminal output to a file:</p> <pre>cd /media/HSMFD script script-20140110.log</pre>		

## Start Logging HSM Output

Step	Activity	Initial	Time (UTC)
23	CA connects the HSM to the laptop using a serial cable.		
24	<p>CA opens a second terminal screen and ensures its default directory is also /media/HSMFD and executes:</p> <pre>ttyaudit /dev/ttyUSB0</pre> <p>to start logging HSM serial port output. Note: DO NOT unplug USB serial port adaptor from laptop as this causes logging to stop.</p>		

## Connecting offline HSM (KSK-HSM-01B-SJC)

Step	Activity	Initial	Time (UTC)
25	CA inspects the HSM TEB for tamper evidence and removes it from TEB; discards TEB and plugs ttyUSB0 null modem serial adaptor and cable to the back.		
26	<p>CA connects power to HSM. Status information should appear on the serial logging screen and after self test the HSM display should say</p> <pre>"Set Online"</pre> <p>indicating the HSM is in the initialized state.</p>		

Activate HSM

Step	Activity	Initial	Time (UTC)
27	<p>CA sets HSM online using the “Set Online” menu item and three (3) OP cards. The “Ready” LED should illuminate.</p> <p>Use OP cards 1, 2 and 5, and PIN 11223344.</p>		
28	<p>CA connects Ethernet cable between laptop and HSM and tests network connectivity between laptop and HSM by entering</p> <pre data-bbox="310 621 570 646">ping 192.168.0.2</pre> <p>on the laptop terminal window and looking for responses. Ctrl-C to exit program.</p>		
29	<p>CA inserts flash drive labeled “SCRIPTS” into a free USB slot and waits for O/S to recognize the FD.</p>		
30	<p>CA copies the compressed scripts from the drive labeled “SCRIPTS”.</p> <pre data-bbox="310 957 776 1010">cp -p /media/SCRIPTS/scripts-20140110.tar.gz .</pre>		
31	<p>CA calculates sha256 checksum of the compressed scripts on the drive labeled “SCRIPTS” and reads it aloud, four digits at a time.</p> <pre data-bbox="310 1163 841 1188">sha256sum scripts-20140110.tar.gz</pre> <p>EW records the sixty-four digit checksum of the file “scripts-20140110.tar.gz”.</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>		

## Start generating Keys and Keybundles

Step	Activity	Initial	Time (UTC)
32	<p>CA copies shell scripts that will be used to generate new keys and bundles by executing:</p> <pre>ls /media/SCRIPTS  tar -xzvof /media/SCRIPTS/scripts-20140110.tar.gz  cp -p makeallhsmfiles /opt/dccom  cp -p exkey /opt/dccom  cp -p keybundle-generate.20120530 /opt/dccom  mkdir /tmp/pch  cp -p 20140110.kc_script_gen.out /tmp/pch  cp -p /opt/dnssec/aep.hsmconfig /tmp/pch</pre>		
33	<p>CA creates encrypted backups of the ZSKs by executing:</p> <pre>cd /tmp/pch  makeallhsmfiles</pre>		
34	<p>CA starts key and signature generation by executing:</p> <pre>keybundle-generate.20120530 &lt; 20140110.kc_script_gen.out</pre> <p>The data file contains a line for each zone for which ZSKs will be rolled or a new zone will be generated. This will take a long time generating ZSKs and KSKs as necessary and creating keybundles (KSK signed DNSKEY RRsets). KSKs and ZSKs will automatically be backed up in encrypted form and deleted from HSM as each zone is completed.</p> <p>This step is complete when the CA has issued the command above.</p>		

Re-Package OP Cards

Step	Activity	Initial	Time (UTC)
35	CA places each OP card with pre-printed warning slip in its own new TEB and records the TEB # in the EW's copy of the smart card sign out sheet below, reading it aloud for verification and giving the TEB tear-off strip to the EW.		

Re-Distribution of Cards

Step	Activity	Initial	Time (UTC)
36	CA calls each CO to retrieve their smartcards. As each CO receives and inspects their cards, they verify, date and sign the EW's copy of the sign out sheet below and EW initials their entry.		

Smart Card Sign Out Sheet

CO#	Card Type	TEB #	Printed Name	Signature	Date	Time	EW
CO1	OP 1 of 7		Steve FELDMAN		1/10/14		
CO2	OP 2 of 7		Michael SINATRA		1/10/14		
CO5	OP 5 of 7		Stephan SOMOGYI		1/10/14		

Optionally leave facility

Step	Activity	Initial	Time (UTC)
37	Optionally, all participants can now leave the room if the room is closed and sealed until everyone's return.		



## Pack and store Keys and Keybundles

Step	Activity	Initial	Time (UTC)
38	CA waits for key generation script to complete.		
39	CA generates the archive destined for the signers by executing:  <pre>tar czfv /media/HSMFD/20140110.kb.tar.gz zsk*.hsm *.keybundle.tar.gz *.keybundle.tar.gz.sha256</pre>		
40	CA archives all results including encrypted KSKs for future use by executing:  <pre>tar czfv /media/HSMFD/20140110.session.tar.gz .</pre>		
41	CA executes:  <pre>cd /media/HSMFD ls</pre> to return to HSMFD and list contents.		
42	CA creates a snapshot of any changes to DB files by executing:  <pre>tar czf 20140110.KSK-HSM-01B-SJC.db.tar.gz *.db</pre>		
43	CA zeroizes SCRIPTS FD and unmounts by executing:  <pre>rm -rf /media/SCRIPTS/* umount /media/SCRIPTS</pre> and removes the SCRIPTS FD for reuse.		

## Return HSM to a Tamper Evident Bag

Step	Activity	Initial	Time (UTC)
44	CA presses RESTART button and waits for self test to complete. CA then disconnects HSM from power and laptop (serial and Ethernet), placing HSM into a new TEB and seals.		

45	CA reads out TEB # and HSM serial #, shows item to participants while EW records TEB # and HSM serial # here.  TEB# _____  HSM Serial#: _____		
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Stop Recording Serial Port Activity

Step	Activity	Initial	Time (UTC)
46	CA terminates HSM serial output capture by disconnecting USB serial adaptors from laptop. CA then exits out of serial output terminal window.		

Backup HSM Flash Drive Contents

Step	Activity	Initial	Time (UTC)
47	CA displays contents of HSMFD by executing  <code>ls -ltr</code>		
48	CA plugs a blank FD labeled "HSMFD KSK-HSM-01B-SJC" into the laptop waits for it to be recognized by the O/S as HSMFD_ and copies the contents of the HSMFD to the blank drive for backup by executing  <code>cp -Rp * /media/HSMFD_</code>		
49	CA unmounts new FD using  <code>umount /media/HSMFD_</code>  and removes HSMFD_ from the laptop.		
50	CA repeats this activity a second time to create a second backup.		
51	CA repeats this activity a third time to create a third backup.		
52	CA repeats this activity a fourth time to create a fourth backup.		
53	CA places first backup HSMFD_ in a new TEB and seals; reads out TEB # and shows item to participants while EW records TEB # here.  TEB# _____		

54	CA places second backup HSMFD_ in a new TEB and seals; reads out TEB # and shows item to participants while EW records TEB # here.  TEB# _____		
55	CA places third backup HSMFD_ in a new TEB and seals; reads out TEB # and shows item to participants while EW records TEB # here.  TEB# _____		
56	CA places fourth backup HSMFD_ in a new TEB and seals; reads out TEB # and shows item to participants while EW records TEB # here.  TEB# _____		

### Stop Logging Terminal Output

Step	Activity	Initial	Time (UTC)
57	CA stops logging terminal output by entering "exit" in remaining terminal window		

### Return HSMFD to a Tamper Evident Bag

Step	Activity	Initial	Time (UTC)
58	CA unmounts HSMFD by executing  <code>cd /tmp</code>  then  <code>umount /media/HSMFD</code>		
59	CA removes HSMFD and places it in new TEB and seals; reads out TEB # and shows item to participants.  EW records TEB # here.  TEB# _____		

## Return Boot-DVD to a Tamper Evident Bag

Step	Activity	Initial	Time (UTC)
60	CA executes:  <code>shutdown -h now</code>  removes DVD and turns off laptop.		
61	CA places boot-DVD in new TEB and seals; reads out TEB # and shows item to participants.  EW records TEB # here.  TEB# _____		

## Return Laptop to a Tamper Evident Bag

Step	Activity	Initial	Time (UTC)
62	CA disconnects power, and any other connections from laptop and puts laptop in new TEB and seals; reads out TEB #; shows item to participants.  EW records TEB # here.  TEB# _____		

## Return Power Supplies, USB Hub, and Cables

Step	Activity	Initial	Time (UTC)
63	CA places HSM and laptop power supplies, USB hub, USB serial adapter, power and networking cables in a bag. This need not be a TEB as it is only used for convenient packaging.		

64	<p>SC returns items to the safe. SC records return of each item on the safe log with TEB #, printed name, date, time, and signature with a second participant initialing each entry.</p> <ul style="list-style-type: none"> <li>- KSK-HSM-01B-SJC HSM</li> <li>- laptop</li> <li>- original HSMFD above</li> <li>- fourth HSMFD backup</li> <li>- DVD</li> </ul> <p>Power supplies and cables need not go in the safe, but can be stored separately.</p>		
65	<p>SC closes safe. EW verifies it is locked.</p>		

Sign-Out on Participant Signature Sheet

Step	Activity	Initial	Time (UTC)
66	<p>All participants leave the Key Management Facility, sign the Participant Signature Sheet, and note their exit time.</p>		
67	<p>CA reviews EWs script and signs it.</p> <p>CA Signature _____</p>		

Sign Out of Facility

Step	Activity	Initial	Time (PDT)
68	<p>FO returns phones, laptops, and other items to participants and logs their exit times. Participants return identification vests to the FO. Participants are now free to depart.</p>		

Stop Audio-Visual Recording

Step	Activity	Initial	Time (PDT)
69	<p>FO stops audio and video recording.</p>		

Copy and Store the Script

Step	Activity	Initial	Time (PDT)
70	<p>EW makes at least 2 copies of his or her script: one for off-site audit bundle, one for on-site audit bundle, copies for other participants as requested, and retaining the original.</p> <p>The two audit bundles each contain:</p> <ul style="list-style-type: none"> <li>- output of signer system - HSMFD</li> <li>- copy of EWs key ceremony script</li> <li>- audio-visual recording</li> <li>- logs from the Facility Physical Access Control</li> <li>- SC attestation (A.2 below)</li> <li>- the EW attestation (A.1 below)</li> </ul> <p>all in a TEB labeled "Key Ceremony 01/10/2014", dated and signed by EW and CA. One bundle will be stored by the SC along with equipment. The second bundle will be kept securely offsite.</p> <p>CA keeps any remaining materials (e.g. extra HSMFD) for next key ceremony preparation and analysis.</p>		

**Appendix A:**  
**Key Ceremony Script Attestation**  
**(by EW)**

I hereby attest that the Key Ceremony was conducted in accordance with this script and that any excpetions which may have occurred were accurately and properly documented on the attached Script Exception Forms.

Printed Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**Insert Notary Acknowledgement Here**



**Appendix B:**  
**Access Control System Attestation**  
**(by SC)**

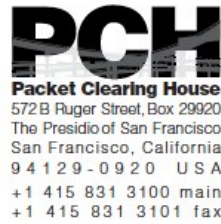
I have reviewed the physical access control system and not found any discrepancies or anything else out of the ordinary.

Attached is the audited physical access log.

Printed Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



## 1600 Shattuck Avenue Facilities Sign-In Sheet

Role	Name	Signature	Date	Entry Time PDT	Exit Time PDT
FO	Peter ROWLAND		1/10/14		
CA	Robert MARTIN- LEGENE		1/10/14		
EW	Larry JORDAN		1/10/14		
CO1	Steve FELDMAN		1/10/14		
CO2	Michael SINATRA		1/10/14		
CO5	Stephan SOMOGYI		1/10/14		
SC2	Bob ARASMITH		1/10/14		
R	Rick WESSON		1/10/14		
R	Bruce KOBALL		1/10/14		

## **Appendix C:**

### **Abbreviations Used in This Document**

#### **Roles**

CA	Ceremony Administrator
EW	External Witness
SC	Security Controller
CO	Crypto Officers
FO	Facilities Officer
R	Registry Representative

#### **Other Abbreviation**

TEB	Tamper Evident Bag (MMF Industries, item #2362010N20 small or #2362011N20 large)
HSM	Hardware Security Module
FD	Flash Drive
AAK	Adapter Authorization Key
SMK	Storage Master Key
OP	Operator
SO	Security Operator

## Appendix D: Letter and Number Pronunciation

Character	Call Sign	Pronunciation
<b>A</b>	Alfa	AL-FAH
<b>B</b>	Bravo	BRAH-VOH
<b>C</b>	Charlie	CHAR-LEE
<b>D</b>	Delta	DELL-TAH
<b>E</b>	Echo	ECK-OH
<b>F</b>	Foxtrot	FOKS-TROT
<b>G</b>	Golf	GOLF
<b>H</b>	Hotel	HOH-TEL
<b>I</b>	India	IN-DEE-AH
<b>J</b>	Juliet	JEW-LEE-ETT
<b>K</b>	Kilo	KEY-LOH
<b>L</b>	Lima	LEE-MAH
<b>M</b>	Mike	MIKE
<b>N</b>	Novemb er	NO-VEM-BER
<b>O</b>	Oscar	OSS-CAH
<b>P</b>	Papa	PAH-PAH
<b>Q</b>	Quebec	KEH-BECK
<b>R</b>	Romeo	ROW-ME-OH
<b>S</b>	Sierra	SEE-AIR-RAH
<b>T</b>	Tango	TANG-GO
<b>U</b>	Uniform	YOU-NEE-FORM
<b>V</b>	Victor	VIK-TAH
<b>W</b>	Whiskey	WISS-KEY
<b>X</b>	Xray	ECKS-RAY
<b>Y</b>	Yankee	YANG-KEY
<b>Z</b>	Zulu	ZOO-LOO
<b>1</b>	One	WUN
<b>2</b>	Two	TOO
<b>3</b>	Three	TREE
<b>4</b>	Four	FOW-ER
<b>5</b>	Five	FIFE
<b>6</b>	Six	SIX
<b>7</b>	Seven	SEV-EN
<b>8</b>	Eight	AIT
<b>9</b>	Nine	NIN-ER
<b>0</b>	Zero	ZEE-RO

## Appendix: E

### Card Distribution from Key Ceremony 1

Step	Activity	Initial	Time
103	Due to limited number of personnel at this key ceremony, cards will be distributed in groups that maintain multi-person control requirements. A subsequent key ceremony will redistribute cards to their final holders. Each group of cards shall be placed in another TEB whose numbers are recorded below on the EW's script.	<i>JF</i>	8:37PM
104	SMK1, SO1, OP1 TEB# <u>A21094986</u> go to CO1, Steve FELDMAN.	<i>JF</i>	8:39PM
105	SMK5, SO5, OP5 TEB# <u>A21094983</u> are entrusted to CO1, Steve FELDMAN, for conveyance to CO5, Stephan SOMOGYI.	<i>JF</i>	8:43PM
106	SMK2, SO2, OP2 TEB# <u>A21094985</u> go to CO2, Michael SINATRA.	<i>JF</i>	8:45PM
107	SMK3, SO3, OP3 TEB# <u>A21094984</u> go to CO3, Kim DAVIES.	<i>JF</i>	8:46PM
108	SMK6, SO6, OP6 TEB# <u>A21094982</u> are entrusted to CO3, Kim DAVIES, for conveyance to CO6, LEONG Keng Thai.	<i>JF</i>	8:48PM
109	SMK 4, SO4, OP4 TEB# <u>A21094980</u> go to CO4, Jonny MARTIN.	<i>JF</i>	8:49PM
110	SMK7, SO7, OP7 TEB# <u>A21094981</u> are entrusted to CO4, Jonny MARTIN, for conveyance to CO7, Gaurab UPADHAYA.	<i>JF</i>	8:50PM

# Appendix: F

## Smart Card Sign Out Sheet from Key Ceremony 1

DNSSEC Key Ceremony Script		Tuesday, April 26, 2011					
Smart Card Sign Out Sheet							
CO#	Card Type	TEB #	Printed Name	Signature	Date	Time	EW
	OP 1 of 7	A21095013	Steve FELDMAN	<i>[Signature]</i>	4/25/11	20:56	1/6
-1	SO 1 of 7	A21095012	Steve FELDMAN	<i>[Signature]</i>	4/25/11	20:56	1/6
-	SMK 1 of 7	A21095011	Steve FELDMAN	<i>[Signature]</i>	4/25/11	20:56	1/6
	OP 2 of 7	A21095010	Michael SINATRA	<i>[Signature]</i>	4/25/11	20:55	1/6
1	SO 2 of 7	A21095009	Michael SINATRA	<i>[Signature]</i>	4/25/11	20:55	1/6
-	SMK 2 of 7	A21095008	Michael SINATRA	<i>[Signature]</i>	4/25/11	20:55	1/6
	OP 3 of 7	A21095007	Kim DAVIES	<i>[Signature]</i>	4/25/11	8:52	1/6
1	SO 3 of 7	A21095006	Kim DAVIES	<i>[Signature]</i>	4/25/11	8:52	1/6
-	SMK 3 of 7	A21095004	Kim DAVIES	<i>[Signature]</i>	4/25/11	8:52	1/6
	OP 4 of 7	A21095005	Jonny MARTIN	<i>[Signature]</i>	4/25/11	8:58	1/6
1	SO 4 of 7	A21095003	Jonny MARTIN	<i>[Signature]</i>	4/25/11	8:58	1/6
-	SMK 4 of 7	A21095002	Jonny MARTIN	<i>[Signature]</i>	4/25/11	8:58	1/6
	OP 5 of 7	A21095001	Steve FELDMAN	<i>[Signature]</i>	4/25/11	20:50	1/6
1	SO 5 of 7	A21095000	Steve FELDMAN	<i>[Signature]</i>	4/25/11	20:56	1/6
-	SMK 5 of 7	A21094999	Steve FELDMAN	<i>[Signature]</i>	4/25/11	20:50	1/6
	OP 6 of 7	A21094998	Kim DAVIES	<i>[Signature]</i>	4/25/11	8:53	1/6
1	SO 6 of 7	A21094997	Kim DAVIES	<i>[Signature]</i>	4/25/11	8:53	1/6
-	SMK 6 of 7	A21094996	Kim DAVIES	<i>[Signature]</i>	4/25/11	8:53	1/6
	OP 7 of 7	A21094995	Jonny MARTIN	<i>[Signature]</i>	4/25/11	8:58	1/6
1	SO 7 of 7	A21094994	Jonny MARTIN	<i>[Signature]</i>	4/25/11	8:58	1/6
-	SMK 7 of 7	A21094993	Jonny MARTIN	<i>[Signature]</i>	4/25/11	8:58	1/6

**Appendix: G**

**Smart Card Sign Out Sheet from Key Ceremony 2**

DNSSEC Key Ceremony Script Monday, May 30, 2011

### Smart Card Sign Out Sheet

CO#	Card Type	TED #	Printed Name	Signature	Date	Time	EW
A19204943	CO1 OP 1 of 7	A19204935	Steve FELDMAN	<i>[Signature]</i>	5/30/11	0047	<input checked="" type="checkbox"/>
	CO1 SO 1 of 7	A19204934	Steve FELDMAN	<i>[Signature]</i>	5/30/11	0047	<input checked="" type="checkbox"/>
	CO1 SMK 1 of 7		Steve FELDMAN		5/30/11		
A19204942	CO2 OP 2 of 7	A19204933	Michael SMATRA	<i>[Signature]</i>	5/30/11	0049	<input checked="" type="checkbox"/>
	CO2 SO 2 of 7	A19204931	Michael SMATRA	<i>[Signature]</i>	5/30/11	0049	<input checked="" type="checkbox"/>
	CO2 SMK 2 of 7		Michael SMATRA		5/30/11		
A19204944	CO4 OP 4 of 7	A19204932	Jonny MARTIN	<i>[Signature]</i>	5/30/11	0050	<input checked="" type="checkbox"/>
	CO4 SO 4 of 7	A19204930	Jonny MARTIN	<i>[Signature]</i>	5/30/11	0050	<input checked="" type="checkbox"/>
	CO4 SMK 4 of 7		Jonny MARTIN		5/30/11		
A19204944	CO5 OP 5 of 7	A19204929	Steve SOMODYI	<i>[Signature]</i>	5/30/11	0051	<input checked="" type="checkbox"/>
	CO5 SO 5 of 7	A19204928	Steve SOMODYI	<i>[Signature]</i>	5/30/11	0051	<input checked="" type="checkbox"/>
	CO5 SMK 5 of 7		Steve SOMODYI		5/30/11		
CO7 OP 7 of 7			Jonny MARTIN		5/30/11		
CO7 SO 7 of 7			Jonny MARTIN		5/30/11		
CO7 SMK 7 of 7			Jonny MARTIN		5/30/11		

A19204944 - CO4  
 A19204943 - CO1  
 A19204942 - CO2  
 A19204941 - CO5

Packet Clearing House Page 25 of 32











# Appendix: H

## Smart Card Sign Out Sheet from Key Ceremony 3

DNSSEC Key Ceremony Script

Monday, June 20, 2011

### Smart Card Sign Out Sheet

CO#	Card Type	TEB #	Printed Name	Signature	Date	Time	EW
CO1	OP 1 of 7	A 19204876	Steve FELDMAN		6/20/11	07:51	
CO3	OP 3 of 7	A 19204874	Kim DAVIES		6/20/11	07:51	
CO4	OP 4 of 7	A 19204872	Jonny MARTIN		6/20/11	07:49	
CO6	OP 6 of 7	A 19204870	LIM Choon Sai		6/20/11	07:50	
CO7	OP 7 of 7	A 19204869	Gaurab UPADHAYA		6/20/11	07:49	

ENCLOSING BAGS:

CO1: A 19204875

CO3: A 19204873

CO4: A 19204871

CO6: A 19204869

CO7: A 19204867



# Appendix: I

## Smart Card Sign Out Sheet from Key Ceremony 4

DNSSEC Key Ceremony Script

Friday, January 20, 2012

### Re-Package OP Cards

Step	Activity	Initial	Time (UTC)
60	CA places each OP card with instruction slip in its own new TEB and records the number in the smart card sign out sheet below.	TF	20:43

### Re-Distribution of Cards

Step	Activity	Initial	Time (UTC)
61	CA calls each CO to return their smartcards. As each CO receives and inspects their cards, they fill out the sign out sheet below and EW initials their entry. Note new outer bags in sheet below.	TF	20:51

### Smart Card Sign Out Sheet

CO#	Card Type	TEB #	Printed Name	Signature	Date	Time	EW
CO2	OP 2 of 7	A19204950	Michael SINATRA	<i>Michael Sinatra</i>	1/20/12	2051	TF
CO2	SO 2 of 7	A19204952	Michael SINATRA	<i>Michael Sinatra</i>	1/20/12	2051	TF
CO4	OP 4 of 7	A19204949	Jonny MARTIN	<i>Jonny Martin</i>	1/20/12	2049	TF
CO4	SO 4 of 7	A19204953	Jonny MARTIN	<i>Jonny Martin</i>	1/20/12	2049	TF
CO5	OP 5 of 7	A19204951	Stephan SOMOGYI	<i>Stephan Somogyi</i>	1/20/12	2046	TF
CO5	<del>OP</del> SO 5 of 7 BAG	A19204954	Stephan SOMOGYI	<i>Stephan Somogyi</i>	1/20/12	2046	TF

~~OUTSIDE BAG~~

## Appendix: J

### Smart Card Sign Out Sheet from Key Ceremony 5

DNSSEC Key Ceremony Script

Friday, April 27, 2012

#### Smart Card Sign Out Sheet

CO#	Card Type	TEB #	Printed Name	Signature	Date	Time	EW
CO1	OP 1 of 7	A19204955	Steve FELDMAN		4/27/12	18:44	
CO1	Outer SO 1 of 7 bag	3112567	Steve FELDMAN		4/27/12	18:44	
CO3	OP 3 of 7	A3112566	Kim DAVIES		4/27/12	18:46	
CO3	Outer SO 3 of 7 Bag	A3112572	Kim DAVIES		4/27/12	18:46	
CO4	OP 4 of 7	A3112565	Jonny MARTIN		4/27/12	18:47	
CO4	Outer SO 4 of 7 bag	A3112593	Jonny MARTIN		4/27/12	18:47	

#### Sign-Out on Participant Signature Sheet

Step	Activity	Initial	Time (UTC)
60	All participants leave the Key Management Facility, sign the Participant Signature Sheet, and note their exit time.		18:50
61	CA reviews EWS script and signs it. CA Signature		18:52

#### Sign Out of Facility

Step	Activity	Initial	Time (UTC)
62	FO returns phones, laptops, and other items to participants and logs their exit times. Participants are now free to depart.		18:53

#### Stop Audio-Visual Recording

Step	Activity	Initial	Time (UTC)
63	SA stops audio and video recording.		18:53

## Appendix: K

### Smart Card Sign Out Sheet from Key Ceremony 5-1

DNSSEC Key Ceremony Script

Wednesday, May 30, 2012

#### Re-Distribution of Cards

Step	Activity	Initial	Time (UTC)
63	CA calls each CO to return their smartcards. As each CO receives and inspects their cards, they fill out the sign out sheet below and EW initials their entry. Note new outer bags in sheet below.	1/	19:14

#### Smart Card Sign Out Sheet

CO#	Card Type	TEB #	Printed Name	Signature	Date	Time	EW
CO1	OP 1 of 7	A28410829	Steve FELDMAN	<i>[Signature]</i>	5/30/12	19:11	1/
CO1	Outer SO 1 of 7	A28410826	Steve FELDMAN	<i>[Signature]</i>	5/30/12	19:11	1/
CO2	OP 2 of 7	A28410828	Michael SINATRA	<i>[Signature]</i>	5/30/12	19:12	1/
CO2	Outer SO 2 of 7	A28410825	Michael SINATRA	<i>[Signature]</i>	5/30/12	19:12	1/
CO4	OP 4 of 7	A28410827	Jonny MARTIN	<i>[Signature]</i>	5/30/12	19:14	1/
CO4	Outer SO 4 of 7	A28410823	Jonny MARTIN	<i>[Signature]</i>	5/30/12	19:14	1/

# Appendix: L

## Smart Card Sign Out Sheet from Key Ceremony 6

DNSSEC Key Ceremony Script

Friday, July 27, 2012

### Re-Distribution of Cards

Step	Activity	Initial	Time (UTC)
67	CA calls each CO to return their smartcards. As each CO receives and inspects their cards, they fill out the sign out sheet below and EW initials their entry. Note new outer bags in sheet below.	11	20:20

### Smart Card Sign Out Sheet

CO#	Card Type	TEB #	Printed Name	Signature	Date	Time	EW
CO1	OP 1 of 7	A284/0816	Steve FELDMAN	<i>[Signature]</i>	7/27/12	2019	11
CO1	<del>Outer 1 of 7</del>		Steve FELDMAN		7/27/12		
CO4	OP 4 of 7	A284/0814	Jonny MARTIN	<i>[Signature]</i>	7/27/12	2019	11
CO4	<del>Outer 4 of 7</del>		Jonny MARTIN		7/27/12		
CO5	OP 5 of 7	A284/0817	Stephan SOMOGYI	<i>[Signature]</i>	7/27/12	2019	11
CO5	<del>Outer 5 of 7</del>		Stephan SOMOGYI		7/27/12		

## Appendix: M

### Smart Card Sign Out Sheet from Key Ceremony 7

DNSSEC Key Ceremony Script

Friday, December 14, 2012



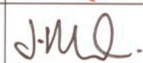
#### Re-Package OP Cards

Step	Activity	Initial	Time (UTC)
65	The CA places each OP card with pre-printed warning slip in its own new TEB and seals TEB, hands the EW the tear-off strip from the TEB to record.	TF	20:44

#### Re-Distribution of Cards


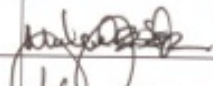


Step	Activity	Initial	Time (UTC)
66	The CA calls each CO to return their smartcards. As each CO receives and inspects their cards, they fill out the sign out sheet below and the EW initials their entry.	TF	20:46

#### Smart Card Sign Out Sheet

CO#	Card Type	TEB #	Printed Name	Signature	Date	Time	EW
CO1	OP 1 of 7	A28410805	Steve FELDMAN		12/14/12	2045	TF
CO2	OP 2 of 7	A28410804	Michael SINATRA		12/14/12	2046	TF
CO4	OP 4 of 7	A28410803	Jonny MARTIN		12/14/12	2046	TF

## Appendix: N

### Smart Card Sign Out Sheet from Key Ceremony 8

DNSSEC Key Ceremony Script		Thursday, September 12, 2013					
<b>Re-Distribution of Cards</b>							
Step	Activity	Initial	Time (UTC)				
63	CA calls each CO to retrieve their smartcards. As each CO receives and inspects their cards, they verify, date and sign the EW's copy of the sign out sheet below and EW initials their entry.	1/1	18:20				
<b>Smart Card Sign Out Sheet</b>							
CO#	Card Type	TEB #	Printed Name	Signature	Date	Time	EW
CO1	OP 1 of 7	A28410802	Steve FELDMAN		9/12/13	1812	1/1
CO2	OP 2 of 7	A28410801	Michael SINATRA		9/12/13	1816	1/1
CO3	OP 3 of 7	A28410800	Kim DAVIES		9/12/13	1819	1/1
<b>Sign-Out on Participant Signature Sheet</b>							
Step	Activity	Initial	Time (UTC)				
64	All participants leave the Key Management Facility, sign the Participant Signature Sheet, and note their exit time.	1/1	22:53				
65	CA reviews EWs script and signs it. CA Signature 	1/1	22:55				
<b>Sign Out of Facility</b>							
Step	Activity	Initial	Time (PDT)				
66	FO returns phones, laptops, and other items to participants and logs their exit times. Participants return identification vests to the FO. Participants are now free to depart.	1/1	3:58 PM				
<b>Stop Audio-Visual Recording</b>							
Step	Activity	Initial	Time (PDT)				
67	SA stops audio and video recording.	1/1	4:00 PM				
Packet Clearing House		Page 12 of 29					

# Appendix: O

## Boot-DVD Checksum from Key Ceremony 1

Step	Activity	Initial	Time
8	CA places boot-DVD and laptop on key ceremony table; connects laptop power and boots laptop from DVD.	JJ	4:48 <sup>00</sup> PM
9	CA logs in as root.	JJ	4:49 PM
10	CA opens a terminal window.	JJ	4:49 PM
11	<p>CA verifies the timezone, date, and time on the laptop and synchronizes it if necessary.</p> <p>Display the current time and timezone: date</p> <p>If the timezone is not set to UTC: cd /etc/ rm localtime ln -s /usr/share/zoneinfo/UTC localtime</p> <p>Set time to match the wall clock: date mmddHHMMYYYY</p> <p>Verify: date</p>	JJ	4:50 PM
12	CA calculates sha256 checksum of the boot-DVD and reads it aloud, four digits at a time.	JJ	5:01 PM
13	<p>EW records the sixty-four digit boot-DVD checksum</p> <p>7DE4 31FN C33D DFEF</p> <p>M 088V A056 13A3 8126</p> <p>708A 3AC1 A784 38A7</p> <p>BNC9 2A4F 52A1 F87C</p>	JJ	5:04 PM
14	CA connects USB hub to laptop.	JJ	4:55 PM
15	CA plugs blank flash disk (FD) labeled HSMFD into a free USB slot on the laptop (NOT on expander); waits for O/S to recognize the FD. CA lets participants view contents of HSMFD then closes FD window.	JJ	4:55 PM